Hotel & Building Operation & Maintenance: Sustainability Insights from Singapore

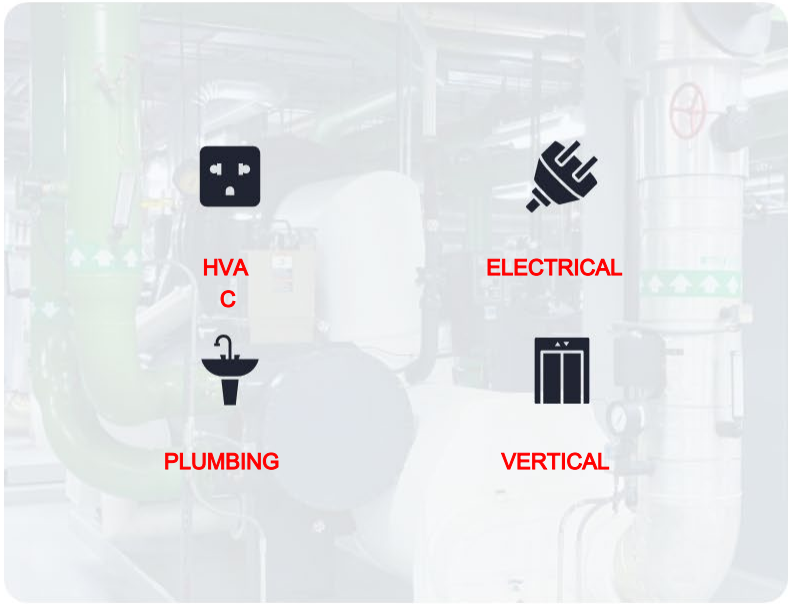
Maximizing Efficiency, Longevity, and Value

Objectives

- Explore O&M practices in hotels and commercial buildings
- Understand Singapore’s sustainability framework
- Learn from case studies and future trends

Why O&M Matters

- Ensures asset reliability and longevity (HVAC, lifts, electrical systems)
- Minimizes unplanned breakdowns and downtime
- Supports regulatory compliance (e.g. Building and Construction Authority and National Environment Agency requirements)
- Optimizes energy efficiency and cost control
- Protects asset value and investment
- Safety



What are the work Scope

1. OPERATIONS SCOPE

Focuses on the day - to - day running of all building systems.

SYSTEM OPERATION

- HVAC system operation (chillers, FCUs, AHUs, ventilation)
- Electrical systems (switchboards, lighting, power distribution)
- Plumbing & sanitary systems (water supply, pumps, drainage)
- Lift & escalator monitoring
- Fire protection system readiness (fire alarm panel, sprinklers)
- Kitchen exhaust & fresh air systems

MONITORING & CONTROL

- BMS (Building Management System) monitoring
- Energy consumption tracking (electricity, water, gas)
- Daily log sheet recording (temperature, pressure, load, etc.)
- Alarm response and troubleshooting

MANPOWER DEPLOYMENT

- 24/7 engineering coverage (shift duty)
- Duty engineer and technician responsibilities
- Coordination with security and housekeeping for incidents

2. MAINTENANCE SCOPE

Focuses on **preventing breakdowns and extending equipment life**.

a. Preventive Maintenance (PM)

•Scheduled servicing based on manufacturer & statutory requirements

•Examples:

- Chiller quarterly servicing
- FCU filter cleaning monthly
- Generator load testing
- Fire system inspection
- Kitchen exhaust cleaning (as you mentioned)

b. Corrective Maintenance (CM)

•Repair or replacement of faulty equipment

•Troubleshooting system failures

•Emergency breakdown response

c. Predictive Maintenance (PdM)

•Condition-based monitoring (vibration, thermal scanning)

•Oil analysis for generators

•Early fault detection to prevent failure

3. SYSTEMS / EQUIPMENT COVERED

MECHANICAL SYSTEMS

Chillers, cooling towers, AHU, FCU, ventilation fans, Pumps, Kitchen exhaust system

ELECTRICAL SYSTEMS

HT/LT switchgear, Transformers, Backup generator (genset), UPS systems, Lighting systems

PLUMBING & SANITARY

Water tanks, Filtration systems, Grease traps, Sewage treatment systems

FIRE PROTECTION

Fire alarm system, Sprinkler system, Fire pumps, Hose reels & extinguishers

VERTICAL TRANSPORT

Lifts & escalators

KITCHEN (HOTEL)

Exhaust hood & ducting, Cold rooms, freezers, Cooking equipment

STRUCTURAL/ARCHITECTURAL

4. COMPLIANCE & STATUTORY REQUIREMENTS

Ensure compliance with local authorities (e.g., fire safety, hygiene)

Annual inspections & certifications

PTW

Permit - to - work system

RA & SWP

Risk assessments & safe work procedures

5. DOCUMENTATION & REPORTING

- Preventive maintenance schedules
- Service reports & checklists
- Asset register & lifecycle tracking
- Incident and breakdown reports
- Energy and sustainability reports

6. CONTRACTOR & VENDOR MANAGEMENT

1. Manage specialized contractors (lift, fire system, chiller)
2. Review service reports
3. Ensure SLA/KPI compliance
4. Cost control and budgeting (CAPEX & OPEX)

Asset Equipment Register

- Track equipment details, warranties, service history, and criticality
- Use the register to plan PM, predict replacement, and manage CAPEX

Asset Equipment Register

ASIA ASSET STATUS As at: **31/01/2026**

ASSET REGISTER - MAJOR MECHNICAL AND ELECTRICAL SYSTEMS LIFE CYCLE

PROPEF XXXXXXXXXXXXXXXXXXX

S/N	M&E System Description	Information					Asset Status			Remarks
		Equipment Location / Floor Level	No of Equipments	Equipment ID Tag	Est. Life Span (No. of Year)	Year of Last Installed	Age of Equipment as of This Year (±No. of Year)	Operational / Physical Condition (Excellent / Good / Average / Poor)	Next Expected Replacement	
1.8										
1.8.1	**Chiller Plant Electrical Control Board**									
1.8.2	Chiller Plant Electrical Control Board	basement 1	1	CH-CP	20	2019	-1	Excellent	2019	Replacement completed
2.1	**Cooling Tower Electrical Control Board**									
2.1.1	Cooling Tower Electrical Control Board	roof top	1	CT 1,2	20	2019	-1	Excellent	2019	Replacement completed
2.1.2	Cooling Tower Electrical Control Board	rooftop	1	CT 3,4	20	2019	-1	Excellent	2019	Replacement completed
2.2	**Varible Speeed Device (VSD) for primary**									
2.2.1	VSD for chilled water	basement 1	1	PCHWP 1	20	2019	-1	Excellent	2019	Replacement completed
2.2.2	VSD for chilled water	basement 1	1	PCHWP 2	20	2019	-1	Excellent	2019	Replacement completed
2.2.3	VSD for chilled water	basement 1	1	PCHWP 3	20	2019	-1	Excellent	2019	Replacement completed
2.2.4	VSD for chilled water	basement 1	1	PCHWP 4	20	2019	-1	Excellent	2019	Replacement completed
2.4	**softstarter for condenser pump**									
2.4.1	softstarter	basement 1	1	CWP 1	20	2019	-1	Excellent	2019	Replacement completed
2.4.2	softstarter	basement 1	1	CWP 2	20	2019	-1	Excellent	2019	Replacement completed
2.4.3	softstarter	basement 1	1	CWP 3	20	2019	-1	Excellent	2019	Replacement completed
2.4.4	softstarter	basement 1	1	CWP 4	20	2019	-1	Excellent	2019	Replacement completed
2.5.1	**AIR-CONDITIONING AND MECHANICAL VENTILATION SYSTEM**									
2.5.2										
	Guestrooms Fan Coil Units (FCU)									
2.6	Guest Room FCU (L5 to L17) C/W	5TH FLOOR TO 17TH FLR	336	FCU	15	2017	1	Excellent		
2.6.1	Guest Room FCU (L4 to L18) O/W	4TH FLOOR TO 18TH FLR	343	FCU	15	2017	1	Excellent		
2.6.2										
	Public Areas Fan Coil Units (FCU)									
2.7	FCU for basement 1	basement 1	16	B1 - 17 to 31	15	1990	28	Average		
2.7.1	FCU for basement 2	basement 2	9	B2 - 1 to 9	15	1990	28	Average		
2.7.2	FCU for basement 3	basement 3&4	2	B3-3/B3-4	15	1990	28	Average		
	FCU for level 1	LEVEL 1	2	1-1 /1-2	15	2008	10	Average		
2.8	FCU for level 2	LEVEL 2	17	2-1 to 2-17	15	2001	17	Average		
2.8.1	FCU for level 3	LEVEL 3	13	3-1 to 3-13	15	1990	28	Average		
2.8.2	FCU for level 4	LEVEL 4	8	4-1 to 4-8	15	2012	6	Average		
	FCU for OW level 18	O/W 18FLOOR	5	18-1 to 18-5	15	2006	12	Average		

Equipment Repair Cost

Equipment	Repair Type	Actual Cos	Date	Lifecycle Impact	Remarks
Chiller Plant	Compressor overhau	SGD 32,50	15-May-26	Extends lifespan by 10 years	Major repair, avoids full replacement
Air Handling Uni	Motor replacement	SGD 4,200	22-May-26	Restores airflow efficiency	Includes labor and testing
Cooling Tower	Fan blade replaceme	SGD 3,800	28-May-26	Prevents vibration and noise issues	Preventive replacement
Elevator System	Control panel repair	SGD 10,80	5-Jun-26	Safety-critical, avoids downtim	Requires certified vendor
Electrical Switchgear	Circuit breaker replacement	SGD 2,250	12-Jun-26	Ensures compliance with electrical codes	Mandatory safety upgrade
Plumbing Syster	Pipe leak repair	SGD 950	18-Jun-26	Prevents water damage and l	Includes materials and lab
Fire Protection System	Pump servicing	SGD 5,300	25-Jun-26	Mandatory for compliance	Annual servicing
Lighting System	LED driver replaceme	SGD 350	30-Jun-26	Improves energy efficiency	Energy-efficient upgrade option

Types of Preventive Maintenance

- **Time-Based Maintenance (TBM)**
  - Scheduled (e.g. monthly, quarterly servicing)

SUMMARY OF PREVENTIVE MAINTENANCE MASTER PLAN 2025

HOTEL: XXXXXXXX

Updated as of: 31-Dec-25

S/N	Equipment Name / Area Serving	Jan		Feb		Mar		Apr		May		Jun		Jul		Aug		Sep		Oct		Nov		Dec		Total No. of PM per Year	Total No. of PM YTD				Remark/Reasons for not able to carry out/complete the PM as planned
		Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual	Plan	Actual		Plan	%	Actual	%	
1	AIR CONDITIONING & MECHANICAL VENTILATION SYSTEM (ACMV)	247	247	245	245	240	240	248	248	248	248	242	242	249	249	247	247	243	243	255	255	243	0	243	0	2950	242	8%	2464	84%	
2	HOT & COLD WATER SYSTEM	1	1	1	1	44	44	1	1	1	1	44	44	1	1	1	1	48	48	1	1	1	0	44	0	188	1	1%	143	76%	
3	FIRE PROTECTION SYSTEM	66	66	66	66	66	66	66	66	366	366	66	66	66	66	66	66	66	66	66	66	366	0	67	0	1393	66	5%	960	69%	
4	ELEVATOR & ESCALATOR SYSTEM	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	17	0	17	0	204	17	8%	170	83%	
5	PLUMBING / SANITARY / SEWERAGE SYSTEM	10	10	14	14	10	10	10	10	14	14	10	10	10	10	14	14	10	10	10	10	14	0	10	0	136	10	7%	112	82%	
6	KITCHEN EQUIPMENT	12	12	92	92	4	4	4	4	92	92	12	12	4	4	92	92	4	4	4	4	92	0	12	0	424	12	3%	320	75%	
7	ELECTRICAL SYSTEM	30	30	20	20	20	20	30	30	20	20	20	20	30	30	20	20	20	20	30	30	169	0	22	0	431	30	7%	240	56%	
8	PABX SYSTEM	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	6	0	0	0	6	0	0%	0	0%	
9	PUBLIC ADDRESS & MUSIC SYSTEM	0	0	0	0	20	20	0	0	0	0	20	20	0	0	0	0	20	20	0	0	0	0	20	0	80	0	0%	60	75%	
10	LAUNDRY EQUIPMENT	21	21	0	0	0	0	21	21	0	0	0	0	21	21	0	0	0	0	21	21	0	0	0	0	84	21	25%	84	100%	
11	STEAM BOILER	0	0	5	5	0	0	0	0	5	5	4	4	0	0	5	5	0	0	0	0	5	0	0	0	24	0	0%	19	79%	
12	SWIMMING POOL / GYM / SPA / WATER FEATURE	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	204	0	204	0	2448	204	8%	2040	83%	

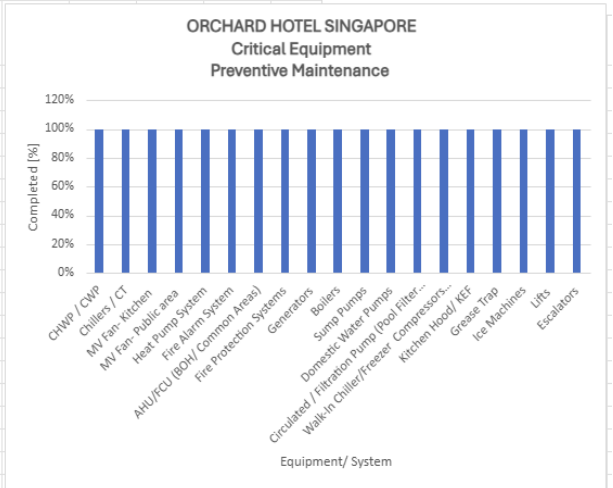
PM Schedule Summary | 1.ACMV | 2.Hot & Cold Water | 3.Fire | 4.Elevator & Escalator | 5.Plumbing, Sanitary & Sewerage | 6. All Kitchen Equipments | 7.Electrical | 8.PABX | 9.Public Address & Music | 10.Laundry

Page 1

Types of Preventive Maintenance

- **Time-Based Maintenance (TBM)**
  - Scheduled (e.g. monthly, quarterly servicing)

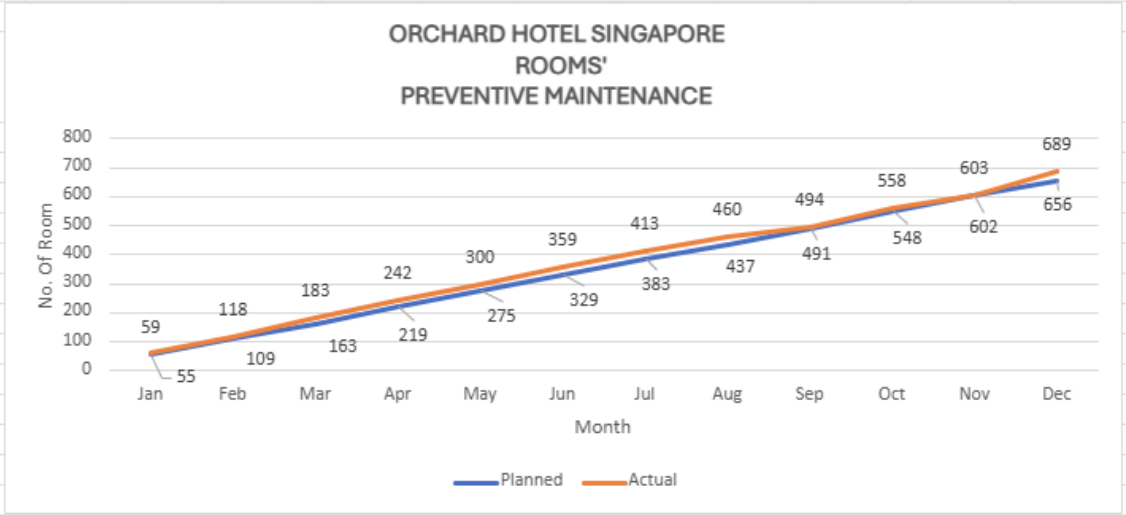
CRITCIAL EQUIPMENT PREVENTIVE MAINTENANCE		ORCHARD HOTEL SINGAPORE					
S/N	Zone Name	Frequency	No of time to complete (1 cycle per year)	No. of Equipment	Month Completed Actual	%Comp	Uploaded Document
1	CHWP / CWP	Monthly	12	8	8	100%	✓
2	Chillers / CT	Monthly	12	8	8	100%	✓
3	MV Fan- Kitchen	Quarterly	4	8	8	100%	✓
4	MV Fan- Public area	Quarterly	4	130	130	100%	✓
5	Heat Pump System	Quarterly	4	7	7	100%	✓
7	Fire Alarm System	Monthly	12	1	1	100%	✓
8	AHU/FCU (BOH/ Common Areas)	Quarterly	4	815	815	100%	✓
10	Fire Protection Systems	Monthly	12	1	1	100%	✓
11	Generators	Quarterly	4	2	2	100%	✗
12	Boilers	Yearly	1	2	2	100%	✗
13	Sump Pumps	Bi-annually	2	8	8	100%	✓
14	Domestic Water Pumps	Yearly	1	9	9	100%	✗
15	Circulated / Filtration Pump (Pool Filter Pump)	Yearly	4	7	7	100%	✗
16	Walk-In Chiller/Freezer Compressors (Kitchen)	Yearly	1	12	12	100%	✗
17	Kitchen Hood/ KEF	Bi Monthly	6	9	9	100%	✓
18	Grease Trap	Monthly	12	3	3	100%	✓
19	Ice Machines	Monthly	12	5	5	100%	✗
20	Lifts	Monthly	12	13	13	100%	✓
21	Escalators	Monthly	12	4	4	100%	✓
	Overall System completed			1052	1052.0	100%	Updated 29092025



Types of Preventive Maintenance

- **Time-Based Maintenance (TBM)**
  - Scheduled (e.g. monthly, quarterly servicing)

ORCHARD HOTEL SINGAPORE				
Month	Planned	Actual completion	Actual completion (%)	Occupancy Rate (%)
	Total room	656		
Jan	55	59	9.0%	75.70%
Feb	109	118	18.0%	74.20%
Mar	163	183	27.9%	63.70%
Apr	219	242	36.9%	65.30%
May	275	300	45.7%	71.60%
Jun	329	359	54.7%	64.00%
Jul	383	413	63.0%	91.20%
Aug	437	460	70.1%	93.90%
Sep	491	494	75.3%	80.50%
Oct	548	558	85.1%	82.90%
Nov	602	603	91.9%	87.50%
Dec	656	689	105.0%	



Samples of Preventative Maintenance report

Samples of Maintenance report

ELEVATOR SERVICE REPORT			PL13	SL7	FL8	SL11
CAR	1	Check the car light / ventilation	☑	☑	☑	☑
	2	Check interior finishes / sign in the car (load plate information, handrails, 3 side walls)	☑	☑	☑	☑
	3	Check indicators and buttons in the COP & COP panel is secured properly	☑	☑	☑	☑
	4	Check alarm bell / intercom	☑	☑	☑	☑
	5	Check KONE Remote Monitoring (KRM) System (If applicable)	NA	NA	NA	NA
CAR DOOR	1	Check the function of door open button	☑	☑	☑	☑
	2	Check the function of closing force limiter	☑	☑	☑	☑
	3	Check the function of Curtain of Light, photocell or safety edge	☑	☑	☑	☑
	4	Check / clean sill grove	☑	☑	☑	☑
	5	Check that lift does not move when car doorway gap is > 25mm	☑	☑	☑	☑
	6	Check condition of car door panels& guide shoes, car doorway gap (≤12mm) & its clearance (≤10mm)	☑	☑	☑	☑
	7	Check advance door opening (If applicable)	NA	NA	NA	NA
GENERAL OPERATION AT EACH FLOOR	1	Check hall indicators and buttons	☑	☑	☑	☑
	2	Check stopping accuracy within +/- 10mm	☑	☑	☑	☑
	3	Check landing sill condition	☑	☑	☑	☑
	4	Check clearance between car and landing sill	☑	☑	☑	☑
	5	Check condition of landing door panels, door frame, landing doorway gap (≤10mm) & its clearance (≤10mm)	☑	☑	☑	☑
	6	Check ride comfort	☑	☑	☑	☑
CONTROL PANEL	1	Check fault codes & record activity into service log book	☑	☑	☑	☑
	2	Test emergency Light & Fan	☑	☑	☑	☑
	3	Check operation of manual brake release system	☑	☑	☑	☑
	4	Perform test to check re-leveling and safety switches function	☑	☑	☑	☑
	5	Check and tighten all power & ground cables	☑	☑	☑	☑
	6	Counter No.	0000	0000	0000	00000
	7	Test earth leakage breaker (If applicable)	☑	☑	☑	☑
MACHINE ROOF OR CAR ROOF	1	Check machine/head room lighting	☑	☑	☑	☑
	2	Check machine room & Car top	☑	☑	☑	☑
	3	Check machine, pulleys, hoisting ropes governor rope & carbon brush for DC Machines	☑	☑	☑	☑
	4	Check overspeed governor mechanism & its linkage for car and counterweight	☑	☑	☑	☑
	5	Audio visual check the machine brake system	☑	☑	☑	☑
	6	Check function of manual lowering valve (hydraulic lift)	NA	NA	NA	NA
	7	Check EBOPs	☑	☑	☑	☑
	8	Check and test ARD	NA	NA	NA	NA
ELEVATOR SHAFT	1	Check guide roller / shoe condition and oil level in the guide rail lubricators (car and counterweight)	☑	☑	☑	☑
	2	Check electrical & mechanical function of the car & landing door lock, coupler clearance & synchronisation rope	☑	☑	☑	☑
	3	Check landing door guide shoes & hanger rollers	☑	☑	☑	☑
	4	Check washer on the rope anchoreges	☑	☑	☑	☑
	5	Check suspension ropes tension	☑	☑	☑	☑
	6	Check for signs of corrosion and wear & tear of all parts of the lift	☑	☑	☑	☑
	7	Check fixing and hoses on the hydraulic cylinder for leaks & clean the seal housing / piston pack (hydraulic lift)	NA	NA	NA	NA
	8	Check shaft lighting (If applicable)	☑	☑	☑	☑
PIT	1	Check the pit lighting and cleanliness	☑	☑	☑	☑
	2	Check counterweight runby	☑	☑	☑	☑
	3	Check the buffer condition and oil level (applicable for oil buffers only)	☑	☑	☑	☑
	4	Check compensating chain / rope condition and rope tension (If applicable)	☑	☑	☑	☑
TECHNICAL MODULE	1	Shaft Module	NA	NA	NA	NA
	2	Landing Door Module	NA	NA	NA	NA
	3	Door Operator Module	☑	☑	☑	☑
	4	Control Panel Module	NA	NA	NA	NA
	5	Machine Module	NA	NA	NA	NA
	6	Signalisation Module	☑	☑	☑	☑

Unit Number : 71NE2242

Unit Name: E1 (HOTEL LOBBY

Building Name : ORCHARD HOTEL SINGAPORE

Job Completion Date 02-Oct-2023

Route : ROUTE 133

Customer Sign Date : 02-Oct-2023

MACHINE ROOM		✓	Δ	X	O	NA
1	Machine Room Environment	✓				
2	Main Supply Switch					
3	Machine Motor					
4	Magnetic Brake	✓				
5	NonReversal Device					
6	MainDrive/ShiftBrake					
7	BrokenChain Device					
8	OverSpeed Switch					
9	Lubrication System					
10	Controller					
11	Inspection Box(IBU)	✓				
12	Auxiliary Brake					

EVERY VISIT(HOUSE KEEPING)		✓	Δ	X	O	NA
1	Machine Room	✓				
2	Pit	✓				

SAFETY FEATURES		✓	Δ	X	O	NA
A	Triangular Wedge Guards	✓				
B	Centre Glass Barrier					
C	Warning Pictographs					

UPPER LANDING(U)		✓	Δ	X	O	NA
12	Landing Condition	✓				
13	Safety Switch Of Comb Plates	✓				
14	Handrill Entry Devices					
15	Newel					
16	Operation Switches	✓				

LOWER LANDING(L)		✓	Δ	X	O	NA
12	Landing Condition	✓				
13	Safety Switch Of Comb Plates	✓				
14	Handrill Entry Devices					
15	Newel					
16	Operation Switches	✓				
17	Step Roller up Thrust Track					

INCLINE SECTION		✓	Δ	X	O	NA
18	Glass	✓				
19	Skit Guard Panels					
20	Balustrade	✓				
21	Handrail guides					
22	Handrails					
23	Tracks					
24	Safety Switches	✓				
25	Handrail Drive					

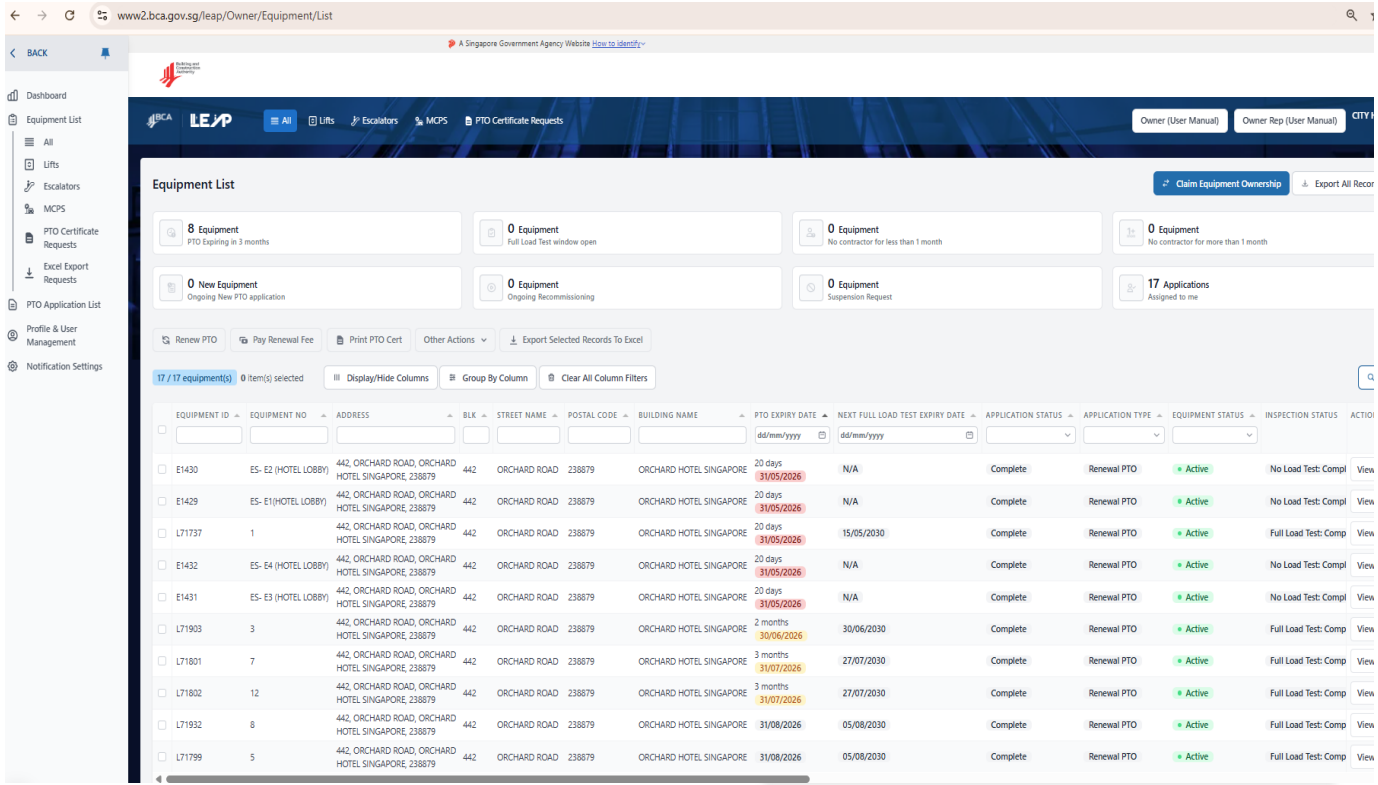
PIT		✓	Δ	X	O	NA
26	PIT Environment	✓				
27	Tension Carriage					
28	Steps					
29	Step Chain					
30	Maintenance Switch					
31	Lighting	✓				
32	Inspection Socket(IBL)					

✓ =NORMAL, Δ = TO BE ADJUSTED,REPLACED,LUBRICATED,CLEANED, X =TO BE REPAIRED OR OVERHAULED, O=SERVICED, REPLACED,LUBRICATED,CLEANED, NA =TIME CONSTRAINT

Samples of Maintenance report

Lift/Escalator General Inspection

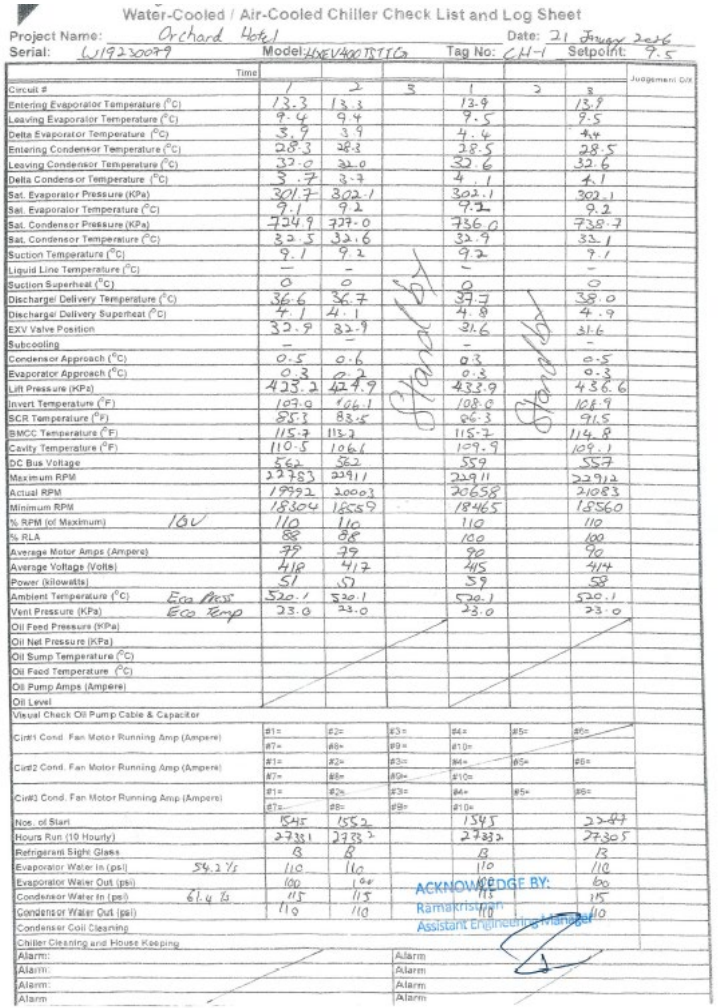
- Machine Room Inspection
- Lift Car Inspection
- Landing Door & Hall Inspection
- Hoistway / Shaft Inspection
- Safety Device Inspection
- Electrical System Inspection
- Functional & Operational Testing
- Load test Annual


www2.bca.gov.sg/leap/Owner/Equipment/List
BACK
Dashboard
Equipment List
All
Lifts
Escalators
MCPS
PTO Certificate Requests
Excel Export Requests
PTO Application List
Profile & User Management
Notification Settings
LEAP
All
Lifts
Escalators
MCPS
PTO Certificate Requests
Owner (User Manual)
Owner Rep (User Manual)
Equipment List
Claim Equipment Ownership
8 Equipment
PTO Expiring in 3 months
0 Equipment
Full Load Test window open
0 Equipment
No contractor for less than 1 month
0 Equipment
No contractor for more than 1 month
0 New Equipment
Ongoing New PTO application
0 Equipment
Ongoing Recommissioning
0 Equipment
Suspension Request
17 Applications
Assigned to me
Renew PTO
Pay Renewal Fee
Print PTO Cert
Other Actions
Export Selected Records To Excel
17 / 17 equipment(s)
0 item(s) selected
Display/Hide Columns
Group By Column
Clear All Column Filters
EQUIPMENT ID
EQUIPMENT NO
ADDRESS
BLK
STREET NAME
POSTAL CODE
BUILDING NAME
PTO EXPIRY DATE
NEXT FULL LOAD TEST EXPIRY DATE
APPLICATION STATUS
APPLICATION TYPE
EQUIPMENT STATUS
INSPECTION STATUS
E1430 ES- E2 (HOTEL LOBBY) 442, ORCHARD ROAD, ORCHARD HOTEL SINGAPORE, 238879 442 ORCHARD ROAD 238879 ORCHARD HOTEL SINGAPORE 20 days 31/05/2026 N/A Complete Renewal PTO Active No Load Test: Compl
E1429 ES- E1(HOTEL LOBBY) 442, ORCHARD ROAD, ORCHARD HOTEL SINGAPORE, 238879 442 ORCHARD ROAD 238879 ORCHARD HOTEL SINGAPORE 20 days 31/05/2026 N/A Complete Renewal PTO Active No Load Test: Compl
L71737 1 442, ORCHARD ROAD, ORCHARD HOTEL SINGAPORE, 238879 442 ORCHARD ROAD 238879 ORCHARD HOTEL SINGAPORE 20 days 31/05/2026 15/05/2030 Complete Renewal PTO Active Full Load Test: Comp
E1432 ES- E4 (HOTEL LOBBY) 442, ORCHARD ROAD, ORCHARD HOTEL SINGAPORE, 238879 442 ORCHARD ROAD 238879 ORCHARD HOTEL SINGAPORE 20 days 31/05/2026 N/A Complete Renewal PTO Active No Load Test: Compl
E1431 ES- E3 (HOTEL LOBBY) 442, ORCHARD ROAD, ORCHARD HOTEL SINGAPORE, 238879 442 ORCHARD ROAD 238879 ORCHARD HOTEL SINGAPORE 20 days 31/05/2026 N/A Complete Renewal PTO Active No Load Test: Compl
L71903 3 442, ORCHARD ROAD, ORCHARD HOTEL SINGAPORE, 238879 442 ORCHARD ROAD 238879 ORCHARD HOTEL SINGAPORE 2 months 30/06/2026 30/06/2030 Complete Renewal PTO Active Full Load Test: Comp
L71801 7 442, ORCHARD ROAD, ORCHARD HOTEL SINGAPORE, 238879 442 ORCHARD ROAD 238879 ORCHARD HOTEL SINGAPORE 3 months 31/07/2026 27/07/2030 Complete Renewal PTO Active Full Load Test: Comp
L71802 12 442, ORCHARD ROAD, ORCHARD HOTEL SINGAPORE, 238879 442 ORCHARD ROAD 238879 ORCHARD HOTEL SINGAPORE 3 months 31/07/2026 27/07/2030 Complete Renewal PTO Active Full Load Test: Comp
L71932 8 442, ORCHARD ROAD, ORCHARD HOTEL SINGAPORE, 238879 442 ORCHARD ROAD 238879 ORCHARD HOTEL SINGAPORE 31/08/2026 05/08/2030 Complete Renewal PTO Active Full Load Test: Comp
L71799 5 442, ORCHARD ROAD, ORCHARD HOTEL SINGAPORE, 238879 442 ORCHARD ROAD 238879 ORCHARD HOTEL SINGAPORE 31/08/2026 05/08/2030 Complete Renewal PTO Active Full Load Test: Comp

Samples of Maintenance report

Chiller System General Inspection

- Check overall chiller operating condition
- Verify no abnormal noise or vibration
- Inspect for refrigerant, oil, or water leakage
- Check cleanliness of chiller area and equipment
- Ensure adequate ventilation in plant room
- Operating Parameters
- Compressor & Evaporator, condenser
- Electrical System
- Condenser & Chilled water Pump System
- Test Run/ Functionality



Water-Cooled / Air-Cooled Chiller Check List and Log Sheet

Project Name: Orchard Hotel — Date: 21 January 2016

Serial: WJ9220079 — Model: YKEV400TSTIG3 — Tag No: CH-1 — Setpoint: 7.5

Time							Judgement Crit
Circuit #	1	2	3	1	2	3	
Entering Evaporator Temperature (°C)	13.3	13.3		13.9		13.9	
Leaving Evaporator Temperature (°C)	9.4	9.4		9.5		9.5	
Delta Evaporator Temperature (°C)	3.9	3.9		4.4		4.4	
Entering Condensor Temperature (°C)	28.3	28.3		28.5		28.5	
Leaving Condensor Temperature (°C)	32.0	32.0		32.6		32.6	
Delta Condensor Temperature (°C)	3.7	3.7		4.1		4.1	
Sat. Evaporator Pressure (KPa)	301.7	302.1		302.1		302.1	
Sat. Evaporator Temperature (°C)	9.1	9.2		9.2		9.2	
Sat. Condensor Pressure (KPa)	734.9	737.0		756.0		738.7	
Sat. Condensor Temperature (°C)	32.5	32.6		32.9		33.1	
Suction Temperature (°C)	9.1	9.2		9.2		9.1	
Liquid Line Temperature (°C)	–	–		–		–	
Suction Superheat (°C)	0	0		0		0	
Discharge/ Delivery Temperature (°C)	36.6	36.7		37.7		38.0	
Discharge/ Dulivery Superheat (°C)	4.1	4.1		4.8		4.9	
EXV Valve Position	32.9	32.9		31.6		31.6	
Subcooling	–	–		–		–	
Condensor Approach (°C)	0.5	0.6		0.3		0.5	
Evaporator Approach (°C)	0.3	0.3		0.3		0.3	
Lift Pressure (KPa)	433.2	427.9		433.9		436.6	
Invert Temperature (°F)	109.0	106.1		108.0		108.9	
SCR Temperature (°F)	85.3	83.5		86.3		91.5	
BMCC Temperature (°F)	115.7	113.2		115.7		114.8	
Cavity Temperature (°F)	110.5	106.1		109.9		109.1	
DC Bus Voltage	562	562		559		557	
Maximum RPM	22783	22911		22911		22912	
Actual RPM	19992	20003		20658		21083	
Minimum RPM	18304	18559		18465		18560	
% RPM (of Maximum) 18V	110	110		110		110	
% RLA	88	88		100		100	
Average Motor Amps (Ampere)	79	79		90		90	
Average Voltage (Volts)	418	417		415		414	
Power (kilowatts)	51	51		59		58	
Ambient Temperature (°C) Evap Press	520.1	520.1		520.1		520.1	
Vent Pressure (KPa) Evap Temp	23.0	23.0		23.0		23.0	
Oil Feed Pressure (KPa)							
Oil Net Pressure (KPa)							
Oil Sump Temperature (°C)							
Oil Feed Temperature (°C)							
Oil Pump Amps (Ampere)							
Oil Level							
Visual Check Oil Pump Cable & Capacitor							
Cir#1 Cond. Fan Motor Running Amp (Ampere)	#1= #7=	#2= #8=	#3= #9=	#4= #10=	#5=	#6=	
Cir#2 Cond. Fan Motor Running Amp (Ampere)	#1= #7=	#2= #8=	#3= #9=	#4= #10=	#5=	#6=	
Cir#3 Cond. Fan Motor Running Amp (Ampere)	#1= #7=	#2= #8=	#3= #9=	#4= #10=	#5=	#6=	
Nos. of Start	1545	1552		1545		22447	
Hours Run (10 Hourly)	27331	27332		27332		27305	
Refrigerant Sight Glass	B	B		B		B	
Evaporator Water In (psi) 54.2 Y/s	110	110		110		110	
Evaporator Water Out (psi)	100	100		115		100	
Condensor Water In (psi) 61.4 Y/s	115	115		115		115	
Condensor Water Out (psi)	110	110		110		110	
Condenser Coil Cleaning							
Chiller Cleaning and House Keeping							
Alarm:			Alarm				
Alarm:			Alarm				
Alarm:			Alarm				
Alarm			Alarm				

Standby

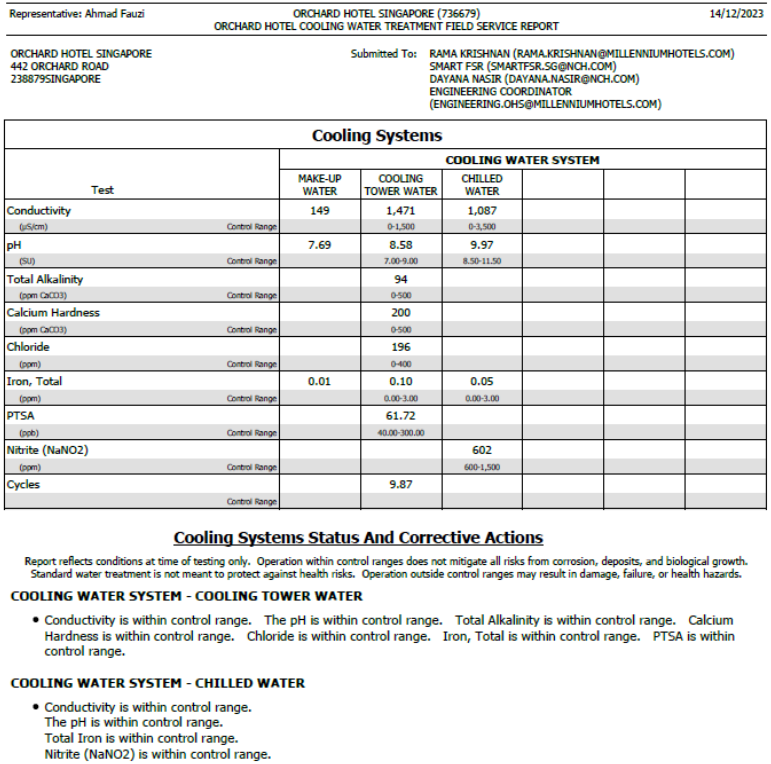
Standby

ACKNOWLEDGE BY:
Ramakrishnan
Assistant Engineering Manager

Samples of Maintenance report

Cooling Tower General Inspection

- Inspect cooling tower structure condition
- Check for abnormal vibration or noise
- Fa & Motor Assembly
- Water Distribution
- Inspect the cooling tower drift/fins
- Water treatment/dosing system
- Electrical system
- Verify housekeeping around cooling tower
- Inspect for corrosion and water leakage
- Test Run/ Functionality



Representative: Ahmad Fauzi

ORCHARD HOTEL SINGAPORE (736679)
ORCHARD HOTEL COOLING WATER TREATMENT FIELD SERVICE REPORT

14/12/2023

ORCHARD HOTEL SINGAPORE
442 ORCHARD ROAD
238879SINGAPORE

Submitted To: RAMA KRISHNAN (RAMA.KRISHNAN@MILLENNIUMHOTELS.COM)
SMART FSR (SMARTFSR.SG@NCH.COM)
DAYANA NASIR (DAYANA.NASIR@NCH.COM)
ENGINEERING COORDINATOR
(ENGINEERING.OHS@MILLENNIUMHOTELS.COM)

Cooling Systems

Test		COOLING WATER SYSTEM					
		MAKE-UP WATER	COOLING TOWER WATER	CHILLED WATER			
Conductivity		149	1,471	1,087			
(µS/cm)	Control Range		0-1,500	0-3,500			
pH		7.69	8.58	9.97			
(SU)	Control Range		7.00-9.00	8.50-11.50			
Total Alkalinity			94				
(ppm CaCO3)	Control Range		0-500				
Calcium Hardness			200				
(ppm CaCO3)	Control Range		0-500				
Chloride			196				
(ppm)	Control Range		0-400				
Iron, Total		0.01	0.10	0.05			
(ppm)	Control Range		0.00-3.00	0.00-3.00			
PTSA			61.72				
(ppb)	Control Range		40.00-300.00				
Nitrite (NaNO2)				602			
(ppm)	Control Range			600-1,500			
Cycles			9.87				
	Control Range						

Cooling Systems Status And Corrective Actions

Report reflects conditions at time of testing only. Operation within control ranges does not mitigate all risks from corrosion, deposits, and biological growth. Standard water treatment is not meant to protect against health risks. Operation outside control ranges may result in damage, failure, or health hazards.

COOLING WATER SYSTEM - COOLING TOWER WATER

- Conductivity is within control range. The pH is within control range. Total Alkalinity is within control range. Calcium Hardness is within control range. Chloride is within control range. Iron, Total is within control range. PTSA is within control range.

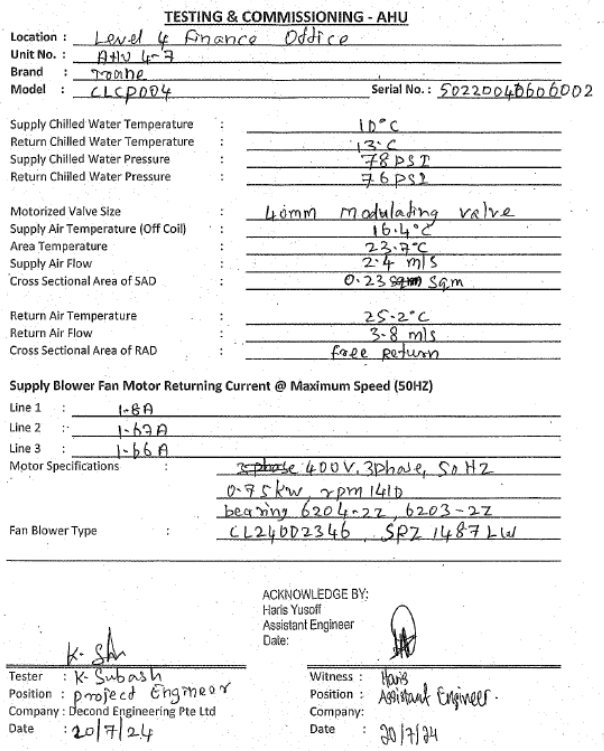
COOLING WATER SYSTEM - CHILLED WATER

- Conductivity is within control range.
  The pH is within control range.
  Total Iron is within control range.
  Nitrite (NaNO2) is within control range.

Samples of Maintenance report

AHU/FCU General Inspection

- Check overall AHU operating condition
- Inspect for abnormal noise and vibration
- Filters
- Fan, belt, gear & Motor
- Cooling Coil
- Drainage system
- Actuator valve
- Thermostat
- Airflow
- Electrical system
- cleanliness
- Check access doors and panel conditions
- Inspect for air leakage and duct connections



TESTING & COMMISSIONING - AHU

Location : Level 4 Finance Office
Unit No. : AHU Lv 7
Brand : Trane
Model : CLSP004 Serial No. : 502200406060002

Supply Chilled Water Temperature	:	10°C
Return Chilled Water Temperature	:	13°C
Supply Chilled Water Pressure	:	78 PSI
Return Chilled Water Pressure	:	76 PSI
Motorized Valve Size	:	40mm Modulating valve
Supply Air Temperature (Off Coil)	:	16.4°C
Area Temperature	:	23.7°C
Supply Air Flow	:	2.4 m/s
Cross Sectional Area of SAD	:	0.23 ~~sqm~~ Sqm
Return Air Temperature	:	25.2°C
Return Air Flow	:	3.8 m/s
Cross Sectional Area of RAD	:	Free return

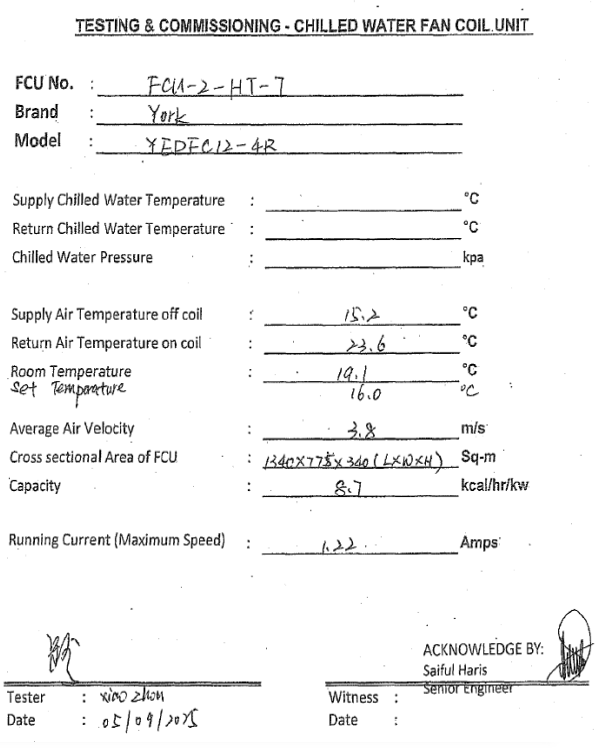
Supply Blower Fan Motor Returning Current @ Maximum Speed (50HZ)

Line 1 : 1.8A
Line 2 : 1.69A
Line 3 : 1.66A
Motor Specifications : ~~3phase~~ 400V, 3phase, 50 HZ
0.75kw, rpm 1410
bearing 6204-2Z, 6203-2Z
Fan Blower Type : CL2400346 SPZ 1487 Lw

ACKNOWLEDGE BY:
Haris Yusoff
Assistant Engineer
Date:

Tester : K. Subash
Position : project Engineer
Company : Decond Engineering Pte Ltd
Date : 20/7/24

Witness : Haris
Position : Assistant Engineer
Company:
Date : 20/7/24



TESTING & COMMISSIONING - CHILLED WATER FAN COIL UNIT

FCU No. : FCU-2-HT-7
Brand : York
Model : YEDFC12-4R

Supply Chilled Water Temperature	:		°C
Return Chilled Water Temperature	:		°C
Chilled Water Pressure	:		kpa
Supply Air Temperature off coil	:	15.2	°C
Return Air Temperature on coil	:	22.6	°C
Room Temperature / Set Temperature	:	19.1 / 16.0	°C / °C
Average Air Velocity	:	3.8	m/s
Cross sectional Area of FCU	:	1340X775X340 (LXWXH)	Sq-m
Capacity	:	8.7	kcal/hr/kw
Running Current (Maximum Speed)	:	1.22	Amps

Tester : xiao zhou
Date : 05/09/2025

ACKNOWLEDGE BY:
Saiful Haris
Senior Engineer

Witness :
Date :

Samples of Maintenance report

Domestic Water Pump General Inspection

- Check overall pump operating condition
- Inspect for abnormal noise and vibration
- Pump & Motor Operation
- Mechanical & Electrical Inspection
- Tank & Pipe
- Verify housekeeping and cleanliness of pump room
- Check for water leakage around pumps and piping
- Inspect pump foundation and mounting bolts

Heat Pump General Inspection

- Check overall heat pump operating condition
- Inspect for abnormal vibration or noise
- Compressor Inspection
- Heat Exchanger
- Fan & Air circuit
- Refrigeration system
- Electrical & water system
- Verify cleanliness around equipment
- Check for refrigerant, oil, or water leakage
- Ensure equipment access clearance
- Calorifier tank for hot water

Date	Location/Zone	Pump Type	Inspection Results	Defects Found	Corrective Action	Technician	Remarks
3-May-26	Zone 1 – Basement	Domestic booster pump	Motor insulation PASS, bearings lubricated	None	N/A	John Tan	System normal
10-May-26	Zone 2 – Roof Tank	Transfer pump	Impeller cleaned, seals checked	Minor leak at seal	Seal replaced	Sarah Lee	Restored to normal
17-May-26	Zone 3 – Kitchen	Hot water circulation pump	Vibration within limits, electrical connections secure	None	N/A	John Tan	Quarterly vibration monitoring advised
24-May-26	Zone 4 – Carpark	Sump pump	Motor tested, float switch operational	Float switch sluggish	Switch replaced	Sarah Lee	Preventive replacement
31-May-26	Zone 5 – Lobby	Fire jockey pump	Pressure test PASS, alignment checked	None	N/A	John Tan	System left in normal condition

ZOE INTERNATIONAL | TESTING AND COMMISSIONING METHOD STATEMENT HEAT PUMP SYSTEM | 1223ZOE:016 OH-OW

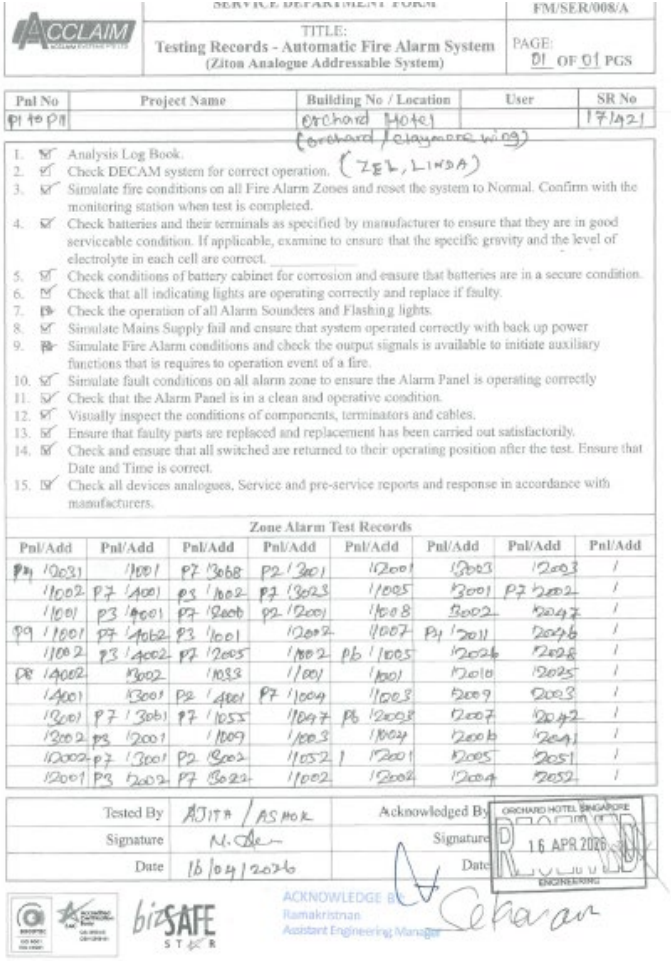
3. **Testing Record Sheet for Heat Pump system**

Project No:	PO # H01012	Test Date:	September 09, 2024
Project Title:	ORCHARD HOTEL	:	
	Orchard Wing	Test Carried Out By:	Eugene Julian

S/NO	DESCRIPTION / COMPONENT MEASURED	RANGE SET @	SITE READING
	HEAT PUMP MODEL : Propac 120BH S/N : 20240712002		
1	Compressor 1 (Amps)	15 ~ 25	19.65 ; 19.78 ; 19.74
2	Compressor 2(Amp)	15 ~ 25	19.89 ; 19.77 ; 20.51
3	Fan motor 1 (amps)	0.8 ~1.5	1.04 ; 1.02 ; 1.09
4	Fan Motor 2 (amps)	0.8 ~1.5	1.09 ; 1.05; 1.11
5	Refrigerant Low Pressure (MPa) Comp. 1	0.5 ~ 1.5	0.9
6	Refrigerant High Pressure (MPa) Comp. 1	2.5 ~ 4.5	3.4
7	Refrigerant Low Pressure (MPa) Comp. 2	0.5 ~ 1.5	0.9
	Refrigerant High Pressure (MPa) Comp.2	2.5 ~ 4.5	3.3

S/NO	DESCRIPTION / COMPONENT MEASURED	RANGE SET @	SITE READING
	HEAT PUMP MODEL : Propac 120BH S/N : 20240712003		
1	Compressor 1 (Amps)	15 ~ 25	19.35 ; 19.31 ; 20.02
2	Compressor 2(Amp)	15 ~ 25	19.46 ; 19.09 ; 19.66
3	Fan motor 1 (amps)	0.8 ~1.5	1.07 ; 1.02 ; 1.07
4	Fan Motor 2 (amps)	0.8 ~1.5	1.09 ; 1.03 ; 1.05
5	Refrigerant Low Pressure (MPa) Comp 1	0.5 ~ 1.5	0.9
6	Refrigerant High Pressure (MPa) Comp 1	2.5 ~ 4.5	3.5
7	Refrigerant Low Pressure (MPa) Comp 2	0.5 ~ 1.5	0.9
8	Refrigerant High Pressure (MPa) Comp 2	2.5 ~ 4.5	3.5

Samples of Maintenance report



ACCLAIM

SERVICE DEPARTMENT FORM — FM/SER/008/A

TITLE: **Testing Records - Automatic Fire Alarm System (Ziton Analogue Addressable System)** — PAGE: 01 OF 01 PGS

Pnl No	Project Name	Building No / Location	User	SR No
P1 to P11		Orchard Hotel (Orchard Telaysonic wing)		17421

1. ☑ Analysis Log Book.
2. ☑ Check DECAM system for correct operation. (ZEL, LINDA)
3. ☑ Simulate fire conditions on all Fire Alarm Zones and reset the system to Normal. Confirm with the monitoring station when test is completed.
4. ☑ Check batteries and their terminals as specified by manufacturer to ensure that they are in good serviceable condition. If applicable, examine to ensure that the specific gravity and the level of electrolyte in each cell are correct.
5. ☑ Check conditions of battery cabinet for corrosion and ensure that batteries are in a secure condition.
6. ☑ Check that all indicating lights are operating correctly and replace if faulty.
7. ☑ Check the operation of all Alarm Sounders and Flashing lights.
8. ☑ Simulate Mains Supply fail and ensure that system operated correctly with back up power
9. ☑ Simulate Fire Alarm conditions and check the output signals is available to initiate auxiliary functions that is requires to operation event of a fire.
10. ☑ Simulate fault conditions on all alarm zone to ensure the Alarm Panel is operating correctly
11. ☑ Check that the Alarm Panel is in a clean and operative condition.
12. ☑ Visually inspect the conditions of components, terminators and cables.
13. ☑ Ensure that faulty parts are replaced and replacement has been carried out satisfactorily.
14. ☑ Check and ensure that all switched are returned to their operating position after the test. Ensure that Date and Time is correct.
15. ☑ Check all devices analogues, Service and pre-service reports and response in accordance with manufacturers.

Zone Alarm Test Records

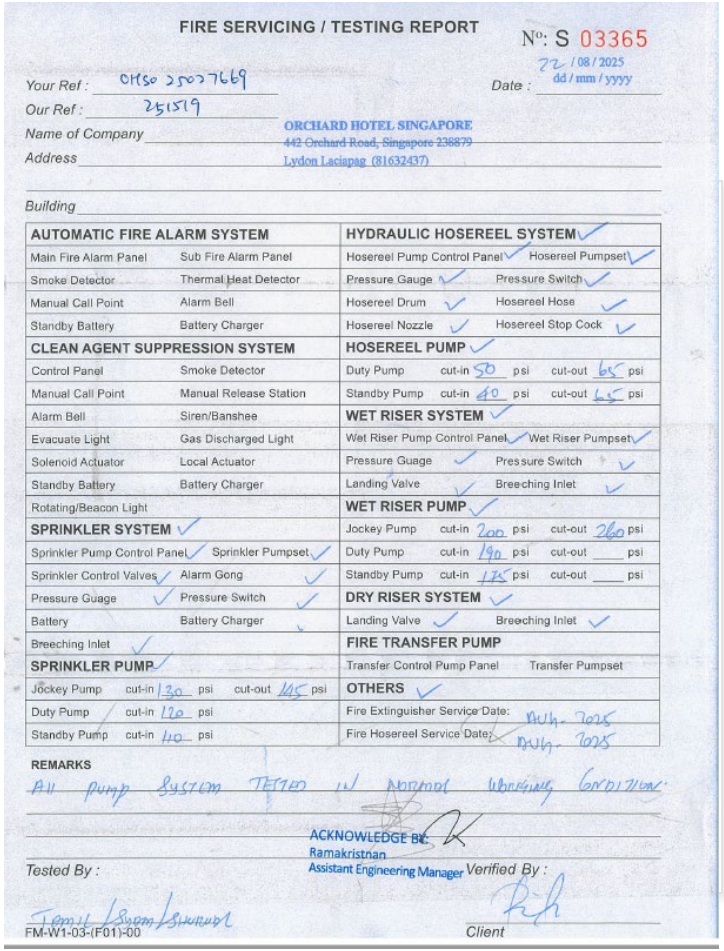
Pnl/Add	Pnl/Add	Pnl/Add	Pnl/Add	Pnl/Add	Pnl/Add	Pnl/Add
P1 1003	1001	P7 3068	P2 1301	12001	13003	12003 /
1002	P7 1001	P3 1002	P7 3023	11005	13001	P7 12002 /
1001	P3 1001	P7 12006	P2 12001	11008	13002	12047 /
P9 11001	P7 11062	P3 1001	12002	11007	P4 13011	12046 /
11002	P3 14002	P7 12005	11002	P6 11005	12026	12028 /
P8 14002	13002	11033	11001	11001	12010	12025 /
14001	13001	P2 14001	P7 11004	11008	12009	12003 /
12001	P7 13061	P7 11055	11047	P6 12008	12007	12042 /
12002	P3 12001	11009	11003	11004	12006	12041 /
12002	P7 13001	P2 12002	11052	12001	12005	12051 /
12001	P3 12002	P7 13022	11002	12002	12004	12052 /

Tested By	AJITH / ASHOK	Acknowledged By	
Signature		Signature	
Date	16/04/2026	Date	16 APR 2026

ORCHARD HOTEL SINGAPORE — ENGINEERING

ACKNOWLEDGE BY: Ramakrishnan, Assistant Engineering Manager

bizSAFE STAR



FIRE SERVICING / TESTING REPORT

Nº: S 03365

Your Ref : OMSO 25027669

Our Ref : 251519

Date : 22 / 08 / 2025 (dd / mm / yyyy)

Name of Company : ORCHARD HOTEL SINGAPORE

Address : 442 Orchard Road, Singapore 238879 — Lydon Lacsapag (81632437)

Building

AUTOMATIC FIRE ALARM SYSTEM		HYDRAULIC HOSEREEL SYSTEM ✓	
Main Fire Alarm Panel	Sub Fire Alarm Panel	Hosereel Pump Control Panel ✓	Hosereel Pumpset ✓
Smoke Detector	Thermal Heat Detector	Pressure Gauge ✓	Pressure Switch ✓
Manual Call Point	Alarm Bell	Hosereel Drum ✓	Hosereel Hose ✓
Standby Battery	Battery Charger	Hosereel Nozzle ✓	Hosereel Stop Cock ✓
CLEAN AGENT SUPPRESSION SYSTEM		**HOSEREEL PUMP** ✓	
Control Panel	Smoke Detector	Duty Pump cut-in 50 psi	cut-out 65 psi
Manual Call Point	Manual Release Station	Standby Pump cut-in 60 psi	cut-out 65 psi
Alarm Bell	Siren/Banshee	**WET RISER SYSTEM** ✓	
Evacuate Light	Gas Discharged Light	Wet Riser Pump Control Panel ✓	Wet Riser Pumpset ✓
Solenoid Actuator	Local Actuator	Pressure Guage ✓	Pressure Switch ✓
Standby Battery	Battery Charger	Landing Valve ✓	Breeching Inlet ✓
Rotating/Beacon Light		**WET RISER PUMP** ✓	
SPRINKLER SYSTEM ✓		Jockey Pump cut-in 200 psi	cut-out 260 psi
Sprinkler Pump Control Panel ✓	Sprinkler Pumpset ✓	Duty Pump cut-in 190 psi	cut-out ____ psi
Sprinkler Control Valves ✓	Alarm Gong ✓	Standby Pump cut-in 175 psi	cut-out ____ psi
Pressure Guage ✓	Pressure Switch ✓	**DRY RISER SYSTEM** ✓	
Battery	Battery Charger ✓	Landing Valve ✓	Breeching Inlet ✓
Breeching Inlet ✓		**FIRE TRANSFER PUMP**	
SPRINKLER PUMP ✓		Transfer Control Pump Panel	Transfer Pumpset
Jockey Pump cut-in 130 psi	cut-out 145 psi	**OTHERS** ✓	
Duty Pump cut-in 120 psi		Fire Extinguisher Service Date:	MAY 2025
Standby Pump cut-in 140 psi		Fire Hosereel Service Date: ✓	MAY 2025

REMARKS: All pump system tested in normal working condition

ACKNOWLEDGE BY: Ramakrishnan, Assistant Engineering Manager

Tested By : Tamil / Suresh / Shankar

Verified By :

Client

FM-W1-03-(F01)-00

Samples of Maintenance report

Preventive Maintenance Service Report		
Exhaust Fan, Fresh Air Fan & Kitchen Exhaus Fresh Air Fan		
Item	**Details**	
Date of Service	_____	
Location	_____	
Equipment Type	☐Exhaust Fan Fresh Air Fan Kitchen Exhaust Fan Kitchen Fresh Air Fan	
Equipment Tag No.	_____	
Vendor / Contractor	_____	
Attended By	_____	
Checked By	_____	
Scope of Maintenance / Cleaning Performed		
Maintenance Item	**Status**	**Remarks**
Isolated power supply and performed LOTO	Done	_____
Checked fan operation before servicing	Done	_____
Cleaned fan impeller / blade	Done	_____
Cleaned fan casing and housing	Done	_____
Cleaned motor exterior	Done	_____
Checked fan belt condition and tension (if applicable)	Done	_____
Checked pulley alignment	Done	_____
Lubricated bearings (if applicable)	Done	_____
Checked motor current and voltage	Done	_____
Tightened electrical terminals	Done	_____
Checked vibration and abnormal noise	Done	_____
Checked mounting supports and vibration isolators	Done	_____
Cleaned air filters (Fresh Air Fan)	Done	_____
Checked airflow condition	Done	_____
Checked damper operation	Done	_____
Cleaned kitchen exhaust grease accumulation	Done	_____
Checked duct cleanliness condition	Done	_____
Checked fire-rated duct integrity	Done	_____
Checked access panel condition	Done	_____
Tested fan operation after servicing	Done	_____
Housekeeping completed	Done	_____
Equipment Readings		
Parameter	**Before Service**	**After Service**
Motor Current (A)	____	____
Voltage (V)	____	____
Fan Speed / RPM	____	____
Airflow Condition	____	____
Noise / Vibration	____	____
Findings / Defects Observed		
Recommendations		

HO GROUP

Clean Build Pte Ltd (UEN: 202121212H)

(+65) 8666 5638

contact@hogroup.sg

hogroup.sg

BCA Registered Contractor

bizSAFE 3

ISO

Service Report (General)

Date: 04 APR 2026

Address: 442 Orchard Rd, Singapore 238879

Client: OHS ENG

Equipment No.: EFB4-1

Equipment Location: B4 (Upper Deck)

Service Summary:

Dust build-up high. Fan blades, casing, motor housing wiped down, brushed, vacuumed. Debris removed. No obstruction.

Remarks and Recommendation

Technician

Clean Build Pte Ltd

Customer Signature

Samples of Maintenance report

ROUTINE INSPECTION REPORT FOR ELECTRICAL INSTALLATION

3.0 Oil / Dry Transformers

Transformers	Transformer No. / KVA Rating			
Item Description	Meiden 1.5 MVA (TX-1)	Pauwels Trafo 1.0 MVA (TX-2)	Meiden 2.0 MVA (TX-3)	Meiden 2.0 MVA (TX-4)
3.1 Sign of oil Leakage / corrosion	NIL	NIL	NIL	NIL
3.2 Cable box / Radiator fins	OK	OK	OK	OK
3.3 Oil temperature	50°C	–	42°C	36°C
3.4 Winding temperature	48°C	44°C	44°C	50°C
3.5 Oil level	OK	OK	OK	OK
3.6 Gas pressure	0.02 MPa	-3 kPA	0.02 MPa	0.015 MPa
3.7 Silica Gel Breather	N.A	N.A	N.A	N.A
3.8 NGR	N.A	N.A	N.A	N.A
3.9 Buchholz Relay / OLTC	N.A	N.A	N.A	N.A
3.10 Abnormal sound	NIL	NIL	NIL	NIL
3.11 Year Manufactured	2024	1998	2014	2014

ROUTINE INSPECTION REPORT FOR ELECTRICAL INSTALLATION

Electrical Installation Information

Name of Installation	City Hotels Pte. Ltd			Date of Inspection	Friday, 13 March 2026
Address	442 Orchard Road, S(238879)			Intake Source	(•) 3ph,22KV ( ) 3ph,400V
EMA License No:	E/16114	Type of Inspection	Monthly	Work Order No.	N.A

1.0 Electrical Installation Rooms

Electrical Installation Rooms	Location / Equipment room for Main Intake Switchboards			
Item Description	HV Switchroom (L1)	TX room (LB)	LV Switchroom (L1)	
1.1 Accessibility	OK	OK	OK	
1.2 Rubber Mat	OK	N.A	OK	
1.3 Danger Warning Signs	OK	OK	OK	
1.4 Single Line Drawing	OK	N.A	OK	
1.5 Fire Extinguisher	OK (Exp: Aug 26)	OK (Exp: Aug 26)	OK (Exp: Aug 26)	
1.6 CPR Rescue Chart	OK	OK	OK	
1.7 EMA License	OK (Exp: 24/04/26)	N.A	OK (Exp: 24/04/26)	
1.8 Log Book	OK	N.A	NIL	
1.9 Ventilation / Dehumidifier	Air-Conditioning	Air-Conditioning	Air-Conditioning	
1.10 Cleanliness	OK	OK	OK	
1.11 Adequate Lighting	OK	OK	OK	
1.12 Water leakage: Walls / Ceiling	NIL	OK	OK	

2.0 Electrical Switchboards

Switchboards (HT / LT)		HVSB-1A	HVSB-2	MSB-1	MSB-1
Item Description		Merlin Gerin PG Inc. 1	Metal-Clad PG Inc. 2	Inc. 1 (TF 1)	Inc. 2 (TF 2)
2.1 Indicating lights		OK	OK	OK	OK
2.2 Protection relays		OK	OK	OK	OK
Protection settings		O/C: 5A, 0.1 TMS E/F: 1A, 0.1s	O/C: 5A, 0.1 TMS E/F: 1A, 0.1TMS	O/C: 1500A, 0.1 TMS E/F: 120A, 0.5s	O/C: 1500A, 0.1 TMS E/F: 120A, 0.5s
2.3 Voltmeter reading		See Appendix	See Appendix	See Appendix	See Appendix
2.4 Ammeter reading		See Appendix	See Appendix	See Appendix	See Appendix
2.5 Power factor		See Appendix	See Appendix	See Appendix	See Appendix
2.6 Circuit labeling		OK	OK	OK	OK
2.7 Sign of corrosion		NIL	NIL	NIL	NIL
2.8 SF_6 gas / Oil Level		OK	OK	N.A	N.A
2.9 ACB / MCCB Condition / Rating		GIS	GIS	ACB OK (1600A)	ACB OK (1600A)
2.10 Cleanliness		OK	OK	OK	OK
2.11 Abnormal sound		NIL	NIL	NIL	NIL
2.12 Year Manufactured		2000	2025	–	–
2.13 Battery Charger	DC Voltage	33 V	32 V	–	–
	Charge Current	1 A	2 A	–	–
	Electrolyte level	OK	OK	N.A	N.A
	Battery condition	OK	OK	–	–

This document contains material which is owned by or licensed to LC Engineering Services Pte Ltd. This material includes, but is not limited to, the design, layout, look, appearance and graphics. Any form of reproduction (full or part of it) is considered copyright infringement under the Copyright Act. Unauthorized use of this material may give rise to a claim for damages and/or be a criminal offence.

UEN: 199201420K

Service Order GS

CUSTOMER	:ORCHARD HOTEL SINGAPORE	SERVICE ORDER NO.	:CSD0002200
CONTACT PERSON	:Mr. Rama Krishnan	SERVICE ORDER DATE	:30/09/2025
CONTACT NO.	:rama.krishnan@millenniumhotels.com	CUSTOMER PO NO.	:OHSO25031441
		CONTRACT NO.	:C251767
SERVICE ADDRESS	:442 Orchard Road Singapore 238879	SCHEDULED DATE TIME	:30/09/2025 09:00
ENGINE SERIAL NO.	:2016109434	ALTERNATOR SERIAL NO.	:H054461
ENGINE MODEL	:G2-TWD1643GE	ALTERNATOR MODEL	:ECO40-1.5L/4
CHECK IN DATETIME	:30/09/2025 09:00	CHECK OUT DATETIME	:30/09/2025 13:00

SUBJECT :Quarterly service G1 and G2

SERVICE DETAILS					
Man-hours & Materials	☑ Chargeable ☐ Non-Chargeable ☐ Warranty ☐ Follow-up				
TEST RUN READING 1					
Time	1139	KW	0	VOLTS((L/L)]	415
FREQ(HZ)	50	AMPS(R)	0	AMPS(Y)	0
AMPS(B)	0	Oil Pres.(Bar)	5.1	Water Temp(°C)	40
Charger(Amps/Volts)	27.5	Exhaust(°C)	-	Hours Run Meter	24
TEST RUN READING 2					
Time		KW		VOLTS((L/L)]	
FREQ(HZ)		AMPS(R)		AMPS(Y)	
AMPS(B)		Oil Pres.(Bar)		Water Temp(°C)	
Charger(Amps/Volts)		Exhaust(°C)		Hours Run Meter	
TEST RUN READING 3					
Time		KW		VOLTS((L/L)]	
FREQ(HZ)		AMPS(R)		AMPS(Y)	
AMPS(B)		Oil Pres.(Bar)		Water Temp(°C)	
Charger(Amps/Volts)		Exhaust(°C)		Hours Run Meter	
TEST RUN READING 4					
Time		KW		VOLTS((L/L)]	
FREQ(HZ)		AMPS(R)		AMPS(Y)	
AMPS(B)		Oil Pres.(Bar)		Water Temp(°C)	
Charger(Amps/Volts)		Exhaust(°C)		Hours Run Meter	
TEST RUN READING 5					
Time		KW		VOLTS((L/L)]	
FREQ(HZ)		AMPS(R)		AMPS(Y)	
AMPS(B)		Oil Pres.(Bar)		Water Temp(°C)	
Charger(Amps/Volts)		Exhaust(°C)		Hours Run Meter	
TEST RUN READING 6					
Time		KW		VOLTS((L/L)]	
FREQ(HZ)		AMPS(R)		AMPS(Y)	
AMPS(B)		Oil Pres.(Bar)		Water Temp(°C)	
Charger(Amps/Volts)		Exhaust(°C)		Hours Run Meter	

ACKNOWLEDGE BY:
Ramakristnan
Assistant Engineering Manager

Samples of Maintenance report

SF6 GAS ANALYZER TEST REPORT

Schneider Electric

Customer Name : GLOBAL SWITCH WOODLANDS
Site Address : 442 Orchard Road
Date of Test : 18-Dec-2024
Location : HV Room

Switchgear Type : GMA 24-25-06
Breaking Capacity : 25 KA
Rated Voltage, Ur : 24KV
Rated Current, In : 630A

Ambient Temperature 27 DEGREE °C

CE

Test Results;

Serial No	Year	Panel No	C.B or Busbar (Bay)	Frost Dew Point °C @ atm.P	Humidity SF6 (ppmw)	SF6 Volume %	SF6 Vessel Pressure (abs rel.)	Remarks
NA	2000	RHS	Busbar	-14.7	207.9	99.3	1.245	Passed

We certify that the above results are a true record of the tests carried out by SCHNEIDER at the site.

OEM Specifications:

Ref	Measurement	OEM Spec (GMA)
1	Frost Dew Point °C	< -15°C
2	Humidity SF6 (ppmw)	<300 ppmw
3	Volume SF6	> 90%
4	SF6 Vessel Pressure Bar	Absolute pressure: 1.15bar (max 1.5bar)

Remarks : No abnormalities discovered during the test.
All results is within the OEM Specifications range.

Test Equipment: M8W SF6 Analyzer 973 Serial No 19-0707

Tested By	SESG	Signature	
Witnessed By	LCES Zhongkai	Signature	
Schneider Electric	Schneider Electric Singapore Pte Ltd	Date of Test	18-Dec-24

Schneider Electric

OPERATION TEST FOR OVERCURRENT & EARTH FAULT RELAY (MAINTENANCE)

Name of Customer : LC ENGINEERING SERVICES PTE LTD
Location : ORCHARD HOTEL, 442 ORCHARD ROAD.
Panel No./Circuit Name : PG Incoming No.1 / 22kV Gmset

PARTICULARS OF RELAYS

Protection	Make	Type	Tripping Charac.	CT Ratio	Serial No.
Overcurrent	Merlin Gerlin	Sepam S40	SI	500/5A	18240149
Earth Fault	Merlin Gerlin	Sepam S40	SI	500/5A	18240149
Solkor R/Rf	Areva	MHOR04	INST	500/5A	S0087601/001

TEST RESULTS

OVERCURRENT RELAY

	Plug Setting (A)	Pick - Up Current (A)			Time Multiplier	Injected Current (A)	Operating Time (sec.)			Standard Time (sec)
		L1	L2	L3			L1	L2	L3	
Overcurrent Elements	5.0	5.1	5.2	5.1	0.1	10.0	0.99	1.02	1.02	1.00
					0.1	15.0	0.63	0.64	0.64	0.63
	Setting (A)	Operating Current (A)								
		L1	L2	L3						
High Set	20.00	20	20.10	20.08						

EARTHFAULT RELAY

	Plug Setting (A)	Pick - Up Current (A)	Time Multiplier	Injected Current (A)	Operating Time (sec.)	Standard Time (sec)
Earth-Fault Element	1.00	1.10	0.1	2	1.08	1.00
				3	0.63	0.63
	Setting (A)	Operating Current (A)				
High Set	5.0	5.05				

SOLKOR R/RF

Injected Phase (A)	Pick - Up Current (A)
L1 - E	1.08
L2 - E	1.25
L3 - E	1.49
L1 - L2	5.21
L2 - L3	5.32
L3 - L1	2.47

Remarks : No abnormalities found on relay.

Tested By Thiru Witnessed By Mr. ARVIND (SESG)

Date of Test 19 Dec 2024 Date of Witness 19 Dec 2024

Schneider Electric

OPERATION TEST FOR OVERCURRENT AND EARTH FAULT RELAY

Name of Customer : LC ENGINEERING SERVICES PTE LTD
Location : ORCHARD HOTEL, 442 ORCHARD ROAD.
Panel No./Circuit Name : Transformer Feeder No- 2 /22kV HITACHI AIS

PARTICULARS OF RELAYS

Protection	Make	Type	Tripping Charac.	CT Ratio	Serial No.
Overcurrent	GEC	CDG	SI	75/5A	543269B
Earth Fault	GEC	FAC	DT	75/5A	543259B

TEST RESULTS

Over Current Relay							Earth Fault Relay				
Plug Setting (A)	Sec. Current (A)	Operating Time (sec.)			TM Setting	Std. Time (sec)	Plug Setting (V)	Sec. Voltage (V)	Operating Time (sec.)	TM Setting	Std. Time (sec)
		L1	L2	L3							
2.50	5.00	1.00	1.01	0.99	0.1	1.00	25.00	25.00	0.05	INST	0.00
2.50	7.50	0.68	0.67	0.67	0.1	0.63					

Plug Setting (A)		Pick - Up Current (A)				Plug Setting (V)	Pick - Up Voltage (V)	
		L1	L2	L3				
2.50		2.52	2.53	2.51		25.00	25.78	
High Set (A)		Operating Current (A)				High Set (A)	Operating Current (A)	
		L1	L2	L3				
20.00		20.01	20.02	20.02		-	-	

Remarks : No abnormalities found on relay.

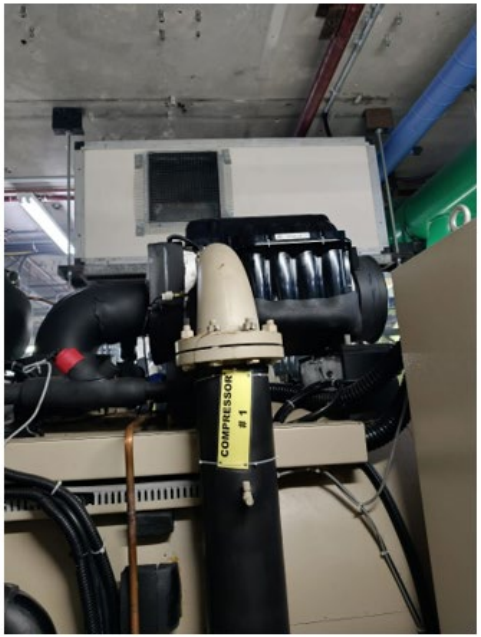
Tested By Thiru Witnessed By Mr. ARVIND (SESG)

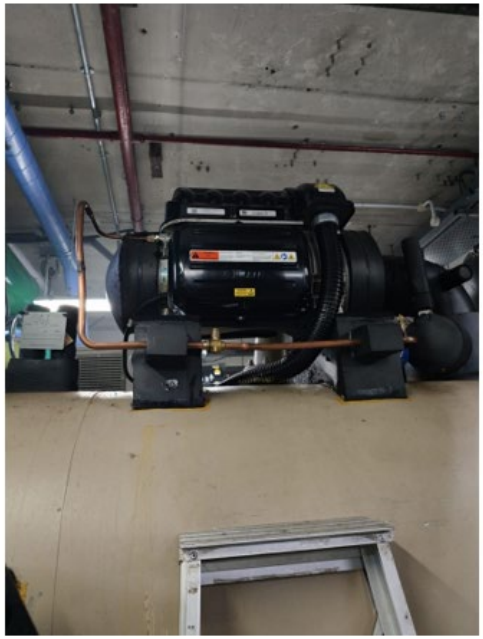
Mandatory Maintenance Frequency

System / Equipment	Mandatory / Guideline Requirement	Frequency	Governing Authority / Reference
Cooling Tower	Cleaning, disinfection, water treatment & legionella contr	Quarterly / Half-Yearly (industry practice)	National Environment Agency (NEA)
Water Storage Tank	Cleaning and inspection	Annually	Public Utilities Board (PUB)
Lift & Escalator	Preventive maintenance servicing	Monthly	Building and Construction Authority (BCA
Fire Protection System	Inspection & servicing	Monthly / Quarterly / Annual	Singapore Civil Defence Force (SCDF)
Fire Extinguishers	Inspection / servicing	Monthly visual / Annual servicing	SCDF
Emergency Lighting & Exit Signs	Functional testing	Monthly / Annual	SCDF
Generator System	Preventive maintenance & load testing	Monthly / Annual	EMA / SCDF
HT / LT Electrical Panels	Inspection & maintenance	Monthly / Annual	Energy Market Authority (EMA)
ACMV System (AHU / FCU)	Cleaning & preventive maintenance	Monthly / Quarterly	BCA / SS 553
Kitchen Exhaust Duct	Degreasing and cleaning	Quarterly / Half-Yearly (depending on usage)	SCDF / NEA
Fresh Air & Exhaust Fans	Cleaning and maintenance	Monthly / Quarterly	Industry Best Practice
Chiller Plant	Preventive maintenance	Monthly	BCA / SS 591
Air Filters (AHU / FCU)	Cleaning / replacement	Monthly / Quarterly	NEA / SS 553
Grease Trap	Cleaning and desludging	Monthly	PUB / SFA
Pest Control Treatment	Pest inspection & treatment	Monthly	NEA / Singapore Food Agency (SFA)
Swimming Pool	Water testing & maintenance	Daily / Weekly / Monthly	NEA
Toilet Exhaust Ventilation	Cleaning and servicing	Quarterly	NEA Guidelines
Sanitary Pipes / Floor Traps	Flushing / maintenance	Periodic	PUB
Transformer & Switchgear	Inspection & servicing	Annual	EMA
Lightning Protection System	Inspection & testing	Annual	SS 555
Gas Detection System	Calibration & testing	Quarterly / Annual	SCDF
Smoke Spill / Pressurization Fan	Functional testing	Monthly	SCDF
Fire Dampers / Smoke Dampers	Inspection & testing	Annual	SCDF / SS 553
Building Façade	Inspection	7-Yearly	BCA
Structural Inspection	Inspection	5-Yearly	BCA

Samples of Corrective Maintenance report

Samples of Corrective Maintenance report





Samples of Corrective Maintenance report

Remarks : **ACBs (Incoming 1 & 2) found with internal mechanism faulty; latching failure (unable to close).

Recommend to cater plans to replace to ensure both ACBs in good condition and safe for operations.

Checked By Zhong Kai

PROFESSIONAL ENGINEER ELECTRICAL BENNY CHEONG W K 4063 SINGAPORE EMA Licence No: 9/21041

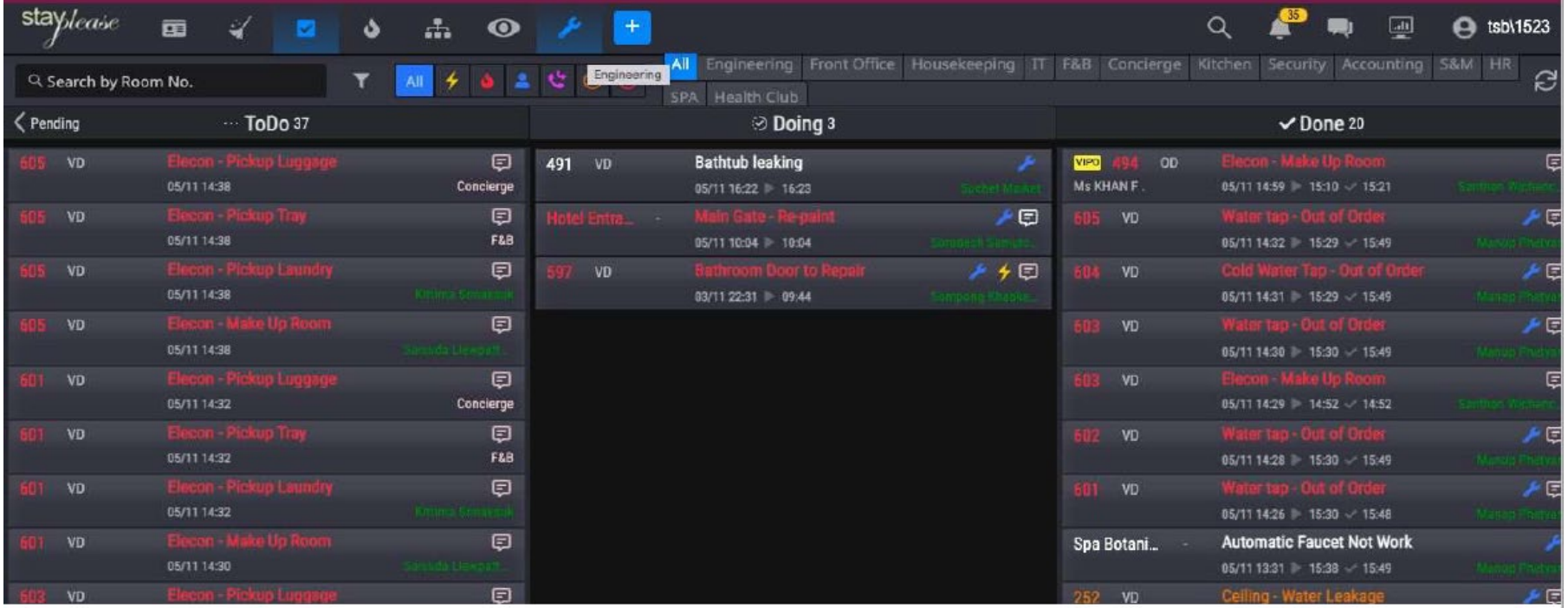
Date 19-Dec-24

Samples of Corrective Maintenance report

ENG WEB

Getting started...

1. Clicking WO icon on Stayplease web to access ENG Module


stayplease
tsb\1523
Search by Room No.
All
Engineering
Front Office
Housekeeping
IT
F&B
Concierge
Kitchen
Security
Accounting
S&M
HR
SPA
Health Club
Pending
ToDo 37
Doing 3
Done 20
605 VD Elecon - Pickup Luggage 05/11 14:38 Concierge
605 VD Elecon - Pickup Tray 05/11 14:38 F&B
605 VD Elecon - Pickup Laundry 05/11 14:38
605 VD Elecon - Make Up Room 05/11 14:38
601 VD Elecon - Pickup Luggage 05/11 14:32 Concierge
601 VD Elecon - Pickup Tray 05/11 14:32 F&B
601 VD Elecon - Pickup Laundry 05/11 14:32
601 VD Elecon - Make Up Room 05/11 14:30
491 VD Bathtub leaking 05/11 16:22 16:23
Hotel Entra... Main Gate - Re-paint 05/11 10:04 10:04
597 VD Bathroom Door to Repair 03/11 22:31 09:44
VIP 494 OD Elecon - Make Up Room Ms KHAN F. 05/11 14:59 15:10 15:21
605 VD Water tap - Out of Order 05/11 14:32 15:29 15:49
604 VD Cold Water Tap - Out of Order 05/11 14:31 15:29 15:49
603 VD Water tap - Out of Order 05/11 14:30 15:30 15:49
603 VD Elecon - Make Up Room 05/11 14:29 14:52 14:52
602 VD Water tap - Out of Order 05/11 14:28 15:30 15:49
601 VD Water tap - Out of Order 05/11 14:26 15:30 15:48
Spa Botani... Automatic Faucet Not Work 05/11 13:31 15:38 15:49
252 VD Ceiling - Water Leakage

Samples of Predictive Maintenance report

Predictive Maintenance (Capex)

Capex Summary 2026

No.	Item	Total Amount
OHS26-N01	Conversion og guest room FCUs Motor to EC Motor for CW & OW Phase 2	$45,900.00
OHS26-N02	PL1, FL3,PL4,CPL18 replace main rope	$20,000.00
OHS26-N03	PL1,PL2, FL3, PL4 replace car & cwt governor rope	$20,000.00
OHS26-N04	FL3 replace main rope	$20,000.00
OHS26-N05	PL4 replace main rope	$20,000.00
OHS26-N06	PL5 replace car governor rope	$20,000.00
OHS26-N07	PL9, PL10, PL12, PL13 replace car & cwt governor rope	$20,000.00
OHS26-N08	CPL18 replace main rope	$20,000.00
OHS26-N09	CPL18 replace governor rope	$20,000.00
OHS26-N10	Ballroom 3 Conversion to EC Motor	$50,000.00
OHS26-N11	Boiler 1 Replacement	$248,900.00
OHS26-N12	Window Sealant Phase 2 for 109 Rooms	$80,000.00
OHS26-N13	BCA Greenmark Gap Analysis	$25,000.00
OHS26-N14	Level 3 Foyer AHUs to Convert to EC Motor	$50,000.00
OHS26-N15	Carpark Exhaust & Fresh Air Fan Replacement	$25,000.00
OHS26-N16	Gas Detection System Replacement for All Kitchen	$21,940.00
OHS26-N17	Replacement of FCUs of Room 1555 GM Apartment	$25,000.00
OHS26-N18	Outdoor Dining Area	$300,000.00
Adhoc OHS26-N19	B1 Female Locker Room Urgent Leaking Repair Works	$14,800.00

Capex Summary 2025

No.	Item	Total Amount
OHS25-N01	Replacement of Lift Rope for Lift No. 5	$39,870.00
OHS25-N02	AHUs Optimasation for lobby, BI, TOC and Level 2	$50,000.00
OHS25-N03	Mini AHUs for OW Guest Corridor	$30,000.00
OHS25-N04	Mini AHUs for CW Guest Corridor	$30,000.00
OHS25-N05	New FCU for TOC Western Grill or Air Curtain	$30,000.00
OHS25-N06	Boiler 1 Overhauling Works	$250,000.00
OHS25-N07	Boiler 1 Replacement of Electrical Works	$50,000.00
OHS25-N08	Domestic Pumps Replacement	$30,000.00
OHS25-N09	Replacement of High Tension Voltage 2 Switchgear & Transformer 2	$783,400.00
OHS25-N10	Additional LED lights at Carpark	$25,000.00
OHS25-N11	Installation of Air Cleaner at Nutmeg Fresh Air	$20,000.00
OHS25-N12A	Solar Film Installatin at Hotel Lobby and Huating Glass Panel	$9,800.00
OHS25-N12B	BCA Greemmark Renewal - Gold Plus	$31,500.00
OHS25-N12C	Application BCA Green Mark	$9,788.99
OHS25-N13	Cooling Tower Recycling	$30,000.00
OHS25-N14	CCTV IP Upgrade to Higher Resolution	$250,000.00
OHS25-N15	Lift Traveling Cable to Enable Autonomous Robot Travel to Hotel Floor	$100,000.00
OHS25-N16	Conversion of Guest Room FCUs Motor to EC Motor One Floor for CW & OW	$57,960.00
Adhoc OHS25-N17	MICE Configuration Services for Level 3 MICE Center, Bridal Room & Linen Room	$30,700.00
Adhoc OHS25-N18	Replacement of 2 nos 2500A 4P ACB for Incomers	$48,500.00
Adhoc OHS25-N19	B1 Locker Room Slab Leaking and Replacement of Ceiling	$12,800.00
Adhoc OHS25-N20	Claymore Wing Guest Rooms Conversion of Single Power Point to Double Gang Power Point	$51,000.00
Adhoc OHS25-N21	Refurbishment of 1 Unit of Compressor for Chiller 3	$53,011.10
Adhoc OHS25-N22	Supply And Replacement Of Clamp On Flowmeter With Transmitter	$9,400.00

Predictive Maintenance (Capex)

Project Capex

Hotel (Hotel Code):

Currency : #N/A

Capex Code	Spend Description (with Brief Justification, e.g. age, condition, need, ROI, etc, and location)	Capex Priorty/Category	Details of Budget (Local Currency)				Capex Submission / Approval Status
			Qty	Unit	Unit Rate	Total Amount	
Input Capex Code (Standard Capex code with hotel's code, financial year, department code, item number)	*Input Spend Description (A brief description of what the capex is for, including its brief justification, i.e. age, condition, need, ROI, etc. and location.)*	*Select Priority/Category :* *P1-Statutory/Health & Safety* *P2-Critical Maintenance* *P3-Revenue Enhancing* TOTALS				*0* *450,000* *8,338,458* 8,788,458	
OHS - 26 - 26P1	**PROPOSED SOFT ENHANCEMENT TO 65 NOS. OF SIGNATURE ROOMS & SUITES, CORRIDORS AND LIFT LOBBY ON THE 15TH TO 18TH STOREY - This is to updated the design of the OW signature rooms since level 4 to level 14 renovated and complete in 2019 - 2024 b/f**					**1,761,489**	
OHS - 26 - 26P1 - A01	Main ID works	P3-Revenue Enhancing	65		18,115	**1,177,479**	To be Submitted
OHS - 26 - 26P1 - B01	Consultancy works	P3-Revenue Enhancing	65		4,700	**305,500**	To be Submitted
OHS - 26 - 26P1 - D01	Contingency sum	P3-Revenue Enhancing	65		4,285	**278,509**	To be Submitted
OHS - 26 - 26P2	**PROPOSED CONVERSION OF SIGNATURE LIBRARY TO 05 NOS OF SIGNATURE 1 BAY SUITES ROOMS AT 18TH STOREY ORCHARD WING - 2024 b/f**					**274,498**	
OHS - 26 - 26P2 - A01	Main ID works	P3-Revenue Enhancing	1		197,978	**197,978**	To be Submitted
OHS - 26 - 26P2 - B01	Consultancy works	P3-Revenue Enhancing	1		23,500	**23,500**	To be Submitted
OHS - 26 - 26P2 - D01	Contingency sum	P3-Revenue Enhancing	1		53,020	**53,020**	To be Submitted
OHS - 25 - 25P1	**PROPOSED SOFT ENCHANCEMENT OF SWIMMING POOL - The condition of hotel swimming pool are already outdated - 2024 b/f**					**250,000**	
OHS - 25 - 25P1 - A01	PROPOSED SOFT ENCHANCEMENT OF SWIMMING POOL - The condition of hotel swimming pool are already outdated - Main ID Works	P3-Revenue Enhancing	1		200,000	**200,000**	To be Submitted
OHS - 25 - 25P1 - B01	PROPOSED SOFT ENCHANCEMENT OF SWIMMING POOL - The condition of hotel swimming pool are already outdated - Consultancy works	P3-Revenue Enhancing	1		50,000	**50,000**	To be Submitted
OHS - 25 - 25P2	**PROPOSED SOFT ENCHANCEMENT OF TOILET AND FLOORING OF 75 NOS OF CLAYMORE WING PREMIUM & CLUB GUEST ROOMS - The toilet condition is outdated as commented by most of the guest and also in has been using it for more than 20 years - 2024 b/f**					**2,044,426**	
OHS - 25 - 25P2 - A01	75 NOS OF CLAYMORE WING PREMIUM & CLUB GUEST ROOMS - Guestrooms toilet enchancement tiles overlay enchancement, Vanity top replacement, toilet enchancement (Refer to ROI sheet as attached)	P3-Revenue Enhancing	75		17,429	**1,307,159**	To be Submitted
OHS - 25 - 25P2 - A02	75 NOS OF CLAYMORE WING PREMIUM & CLUB GUEST ROOMS - Guestrooms room floor enchancement	P3-Revenue Enhancing	75		6,419	**481,390**	To be Submitted
OHS - 25 - 25P2 - D01	75 NOS OF CLAYMORE WING PREMIUM & CLUB GUEST ROOMS - Contingency sum	P3-Revenue Enhancing	75		3,412	**255,877**	To be Submitted
OHS - 26 - 26P3	**PROPOSED CONVERSION OF SIGNATURE LIBRARY TO 05 NOS OF SIGNATURE 1 BAY SUITES ROOMS AT 18TH STOREY ORCHARD WING - 2024 b/f**					**195,600**	
OHS - 26 - 26P3 - A01	PROPOSED CONVERSION OF SIGNATURE LIBRARY TO 05 NOS OF SIGNATURE 1 BAY SUITES ROOMS AT 18TH STOREY ORCHARD WING - Main ID Works	P3-Revenue Enhancing	1		175,200	**175,200**	To be Submitted

Template Guideline | Control | Normal Capex | Project Capex | Budgets-2025 | +

Maintenance Contract Monitoring

Item	M&E System Description	Brand	Company	No. of Plant / Equipment	Contract Sum (per Annum)	Frequency of Servicing	Per Servicing / Billing Cost	Contract Period		
								Duration	From	To
1	**Air-Conditioning & Mechanical Ventilation System**									
1.1	Chiller Plant System	Daikin	Daikin Air-Conditioning (S) Pte Ltd	4	29,400.00	Monthly	2,450.00	1 Year	1-Sep-25	31-Aug-26
1.2	Cooling Tower Cleaning	Kuken	Decond Engineering Pte Ltd	4	15,360.00	Monthly	1,280.00	1 Year	1-Oct-25	30-Sep-26
1.3	Cooling Tower Water Treatment	Kuken	NCH Singapore Pte Ltd	4	10,128.00	Monthly	844.00	2 Year	1-Jan-25	31-Dec-26
1.5	Auto tube cleaning	HVS	HVS Engineering Pte Ltd	4	$ 7,968.00	Quarterly	1,992.00	1 Year	1-Aug-25	31-Jul-26
3	**Heat Pump System**									
3.1	Heat Pump System - Calorex	Cororex	Zoe International Pte Ltd	2	$ 5,600.00	Quarterly	$ 1,400.00	1 Year	1-Sep-25	31-Aug-26
5	**Fire Protection System**									
5.1	Maintenance of Ziton Addressable Fire Alarm System	Ziton Addressable System	Acclaim Systems Pte Ltd (Sole Proprietary System)	2	$ 42,750.00	Monthly	$ 3,562.50	1 Year	1-Mar-26	28-Feb-27
5.2	Maintain in good working order Fire Intercom System		ELV Products Marketing Pte Ltd	2						
5.3	To maintain good working order the PA/EVC/BGM system			2	$ 19,440.00	Monthly	$ 1,620.00	1 Year	1-Oct-25	30-Sep-26
5.4	Fire Sprinkler Protection System		Fire-Mech Pte Ltd	6	$ 4,000.08	Monthly	$ 333.34	1 Year	1-Nov-25	31-Oct-26
6	**Lifts & Escalators**									
6.1	Elevator System		Kone Pte Ltd	13	$ 145,656.00	Monthly	$ 12,138.00	3 Year	1-Mar-25	29-Feb-28
6.2	BCA Licensing for Lift To Operate including PE endorsement and submission to BCA			13	$ 5,460.00	Yearly	$ 5,460.00			
6.3	Escalator system		Otis Elevator Company (S) Pte Ltd	4	$ 53,184.00	Monthly	$ 4,432.00	5 Year	1-May-25	30-Apr-30
6.4	BCA Licensing for Lift To Operate including PE endorsement and submission to BCA			4	$ 27,000.00	Yearly	$ 5,400.00			
7	**Plumbing/Sanitary/Sewerage System**									
7.1	Servicing for ejector tank for legal disposal at PUB treatment plant at Orchard Hotel basement 4 carpark.		AJ Jetting Pte Ltd	4	$ 26,340.00	Monthly	$ 2,195.00	1 Year	1-Jan-26	31-Dec-26
8	**Kitchen Equipment**									
8.1	Kitchen Hot & Cold equipment and Gas Appliances - Orchard Café, Asian Kitche, Hua Ting & Banquet Kitchens	All types of equipment	Reliance kitchen equipment Pte Ltd	4	$ 54,000.00	3 Times Weekly	$ 4,500.00	1 Year	1-Oct-25	30-Sep-26
8.2	Kitchen GEX Exhaust Cleaning	GEX	Blue Sky Engineering (S) Pte Ltd	3	$ 18,600.00	Bi Monthly	$ 3,100.00	2 Years	1-Sep-24	31-Aug-26
8.4	Kitchen Fire Suppression Maintenance	Ansul	Linkgas Engineering Enterprise Pte Ltd	4	$ 8,080.00	Bi annually	$ 4,040.00	1 Year	1-Feb-26	31-Jan-27
8.5	Servicing for BioAmp Program for Orchard Café, Asian Kitchen, Hua Ting & Banquet Kitchen		NCH Singapore Pte Ltd	4	$ 27,840.00	Monthly	$ 2,320.00	1 Year	1-Jan-25	31-Dec-26
9	**Electrical System**									
9.1	22KV Transformers, 22kV, low voltage switch and emergency generator.		LC Engineering Services Pte Ltd	4	$ 2,700.00	Monthly	$ 225.00	1 Year	1-Nov-25	31-Oct-26
9.2	EMA Electrical Licensing	PE LEW		1	$ 100.00	Yearly	$ 100.00	1 Year	1-Nov-25	31-Oct-26
9.3	Maintenance Service for 2 units of Volvo TAD 1643GE Generators and the Associated Control Panel and Fuel System		En-Syst Equipment & Services Pte Ltd	2	$ 6,960.00	Quarterly	$ 1,740.00	1 Year	1-Mar-25	28-Feb-26
14	**Swimming Pool/Gym/Spa/Water Feature**									
14.1	Swimming Pool Pumps System, Swimming Pool Filtration, Water Treatment and Fountains Pumps System		Crystal Clear Contractor Pte Ltd	1	17,400.00	4 times weekly	$ 1,450.00	1 Year	1-Sep-25	31-Aug-26
14.2	Gym Equipment		F1 Recreaction Pte Ltd		2,000.00	Quarterly	$ 500.00	1 Year	1-Apr-24	31-Mar-25
	Lobby Swing Door									
	Provision of Auto Sliding Door Service Maintenance		Dormatic Door Control Specialist Pte Ltd	13	3,850.00	Quarterly	$ 962.50	1 Year	1-Jun-25	31-May-26
24.2	Food Waste Digestor - Service and Maintenance		Zero Waste Solution	1	$ 7,920.00	Monthly	$ 660.00	1 Year	1-Mar-25	28-Feb-26
	Manpower									
	Supply casual labour		Sarah Engineering Pte Ltd		$ 239,616.00	Monthly	$ 19,968.00	2 Years	1-Apr-24	31-Mar-26

Mandatory Licensee

Authority / Agency	Mandatory Licence / Requirement	Applicable Systems / Areas	Mandatory Personnel / Licensee	Typical Frequency
Building and Construction Authorit (BCA)	TOP / CSC	Building occupancy	PE / QP	Upon project completic
	Lift Permit to Operate	Lift & Escalator	Authorized Lift Contrac	Annual
	Periodic Structural Inspection (PSI)	Building structure	PE	5 yearly
	Periodic Façade Inspection (PFI)	Building façade	PE / Specialist PE	7 yearly
	Green Mark Complian	Green Mark Buildin	Green Mark AP	Every 3 years
	Barrier-Free Accessibility Compliance	Public areas	QP / PE	As required
	Mandatory Energy Improvement Regime	Energy	Energy Auditor	As required
Energy Market Author (EMA)	Electrical Installation Licence	Electrical installatio	Licensed Electrical Worker (LEW)	Continuous
	Electrical Maintenanc & Inspection	HT/LT system	LEW	Annual / Periodic
	HT Switching Procedures	HT System	LEW Grade 8 / 9	As required
	Single Line Diagram Updating	Electrical system	LEW	As required
	Generator & Transformer Maintenance	Backup power syste	LEW / Specialist Contractor	Monthly / Annual
Public Utilities Board (PUB)	Water Service Installation Approval	Domestic water system	Licensed Plumber (LP)	As required
	Water Tank Cleaning	Water tanks	Licensed Contractor	Annual
	Backflow Prevention Compliance	Water supply syste	LP	Periodic
	Trade Effluent Approv	Kitchen / Industrial discharge	Licensed Contractor	As required
	Water Efficiency Management Plan	Large water users	Building Owner / FM	Annual

Authority / Agency	Mandatory Licence / Requirement	Applicable Systems / Area	Mandatory Personnel / Licensee	Typical Frequency
Singapore Civil Defence Fo (SCDF)	Fire Certificate (FC)	Designated premises	Fire Safety Manager (FSM)	Annual
	Fire Protection System Maintenance	Fire systems	FSM / Fire Contractor	Monthly / Quarterly
	Fire Drill & Emergency Exer	Entire building	FSM / ERT	Annual
	Fire Safety Audit / Inspection	Entire building	FSM	Annual
	Petroleum & Flammable Material Licence	Fuel / diesel storage	FSM / Building Owner	Annual
	Fire Extinguisher Servicing	Fire protection system	Licensed Fire Contractor	Annual
Singapore Food Agency (S	Food Shop Licence	Kitchens / Restaurants	Food Business Operator	Annual
	Food Hygiene Certification	Food handling areas	Certified Food Handlers	As required
	Food Hygiene Officer (FHO)	Hotel kitchen operations	FHO	Continuous
	Pest Control Program	Kitchen / F&B outlets	Licensed Pest Control Contractor	Monthly
	Grease Trap Maintenance	Kitchen drainage	Maintenance Contractor	Monthly
National Environment Agen (NEA)	Cooling Tower Water Treatment	Cooling towers	Water Treatment Contractor	Monthly
	Legionella Risk Control	Cooling tower system	Water Treatment Specialist	Monthly
	General Waste Disposal Contract/WRMS	Waste management	Licensed Waste Collector	Ongoing
	Toxic Industrial Waste Dispo	Hazardous waste	Licensed TIW Collector	As required
	Environmental Health Compliance	Public areas	Building Owner / FM	Ongoing
	Indoor Air Quality Managem	ACMV system	FM Team / Specialist Contrac	Periodic
	Swimming Pool Water Test	Swimming pool	Pool Operator / Contractor	Daily / Weekly
Ministry of Manpower (MO	Workplace Safety & Health Compliance	Entire workplace	WSH Officer / Coordinator	Continuous
	Risk Assessment (RA)	All maintenance activitie	Supervisor / WSH Personnel	Annual / Review
	Permit-To-Work (PTW)	High-risk works	Authorized Personnel	As required
	Work at Height Compliance	Roof / façade works	Competent Person	As required
	Confined Space Compliand	Tank / manhole works	Confined Space Assessor	As required
	Boiler	Tank	PE	Annual
	Gondola/Movable platform		PE	Annual
Other Statutory / Industry Requirements	Lift Maintenance	Lift systems	Authorized Lift Contractor	Monthly
	Generator Load Test	Emergency generator	LEW / Specialist Contractor	Monthly
	Cooling Tower Cleaning	Cooling tower	Specialist Contractor	Quarterly / Half-Yearly
	Gas Pipe Inspection	Gas system	Licensed Gas Service Worker (LGSW)	Annual / Periodic

Authority / Agency	Mandatory Licence / Requirement	Applicable Systems / Areas	Mandatory Personnel / Licensee	Typical Frequency
Building and Construction Authorit (BCA)	TOP / CSC	Building occupancy	PE / QP	Upon project completic
	Lift Permit to Operate	Lift & Escalator	Authorized Lift Contrac	Annual
	Periodic Structural Inspection (PSI)	Building structure	PE	5 yearly
	Periodic Façade Inspection (PFI)	Building façade	PE / Specialist PE	7 yearly
	Green Mark Complian	Green Mark Buildin	Green Mark AP	Every 3 years
	Barrier-Free Accessibility Compliance	Public areas	QP / PE	As required
	Mandatory Energy Improvement Regime	Energy	Energy Auditor	As required
Energy Market Author (EMA)	Electrical Installation Licence	Electrical installatio	Licensed Electrical Worker (LEW)	Continuous
	Electrical Maintenanc & Inspection	HT/LT system	LEW	Annual / Periodic
	HT Switching Procedures	HT System	LEW Grade 8 / 9	As required
	Single Line Diagram Updating	Electrical system	LEW	As required
	Generator & Transformer Maintenance	Backup power syste	LEW / Specialist Contractor	Monthly / Annual
Public Utilities Board (PUB)	Water Service Installation Approval	Domestic water system	Licensed Plumber (LP)	As required
	Water Tank Cleaning	Water tanks	Licensed Contractor	Annual
	Backflow Prevention Compliance	Water supply syste	LP	Periodic
	Trade Effluent Approv	Kitchen / Industrial discharge	Licensed Contractor	As required
	Water Efficiency Management Plan	Large water users	Building Owner / FM	Annual

Authority / Agency	Mandatory Licence / Requirement	Applicable Systems / Area	Mandatory Personnel / Licensee	Typical Frequency
Singapore Civil Defence Fo (SCDF)	Fire Certificate (FC)	Designated premises	Fire Safety Manager (FSM)	Annual
	Fire Protection System Maintenance	Fire systems	FSM / Fire Contractor	Monthly / Quarterly
	Fire Drill & Emergency Exer	Entire building	FSM / ERT	Annual
	Fire Safety Audit / Inspection	Entire building	FSM	Annual
	Petroleum & Flammable Material Licence	Fuel / diesel storage	FSM / Building Owner	Annual
	Fire Extinguisher Servicing	Fire protection system	Licensed Fire Contractor	Annual
Singapore Food Agency (S	Food Shop Licence	Kitchens / Restaurants	Food Business Operator	Annual
	Food Hygiene Certification	Food handling areas	Certified Food Handlers	As required
	Food Hygiene Officer (FHO)	Hotel kitchen operations	FHO	Continuous
	Pest Control Program	Kitchen / F&B outlets	Licensed Pest Control Contractor	Monthly
	Grease Trap Maintenance	Kitchen drainage	Maintenance Contractor	Monthly
National Environment Agen (NEA)	Cooling Tower Water Treatment	Cooling towers	Water Treatment Contractor	Monthly
	Legionella Risk Control	Cooling tower system	Water Treatment Specialist	Monthly
	General Waste Disposal Contract/WRMS	Waste management	Licensed Waste Collector	Ongoing
	Toxic Industrial Waste Dispo	Hazardous waste	Licensed TIW Collector	As required
	Environmental Health Compliance	Public areas	Building Owner / FM	Ongoing
	Indoor Air Quality Managem	ACMV system	FM Team / Specialist Contrac	Periodic
	Swimming Pool Water Test	Swimming pool	Pool Operator / Contractor	Daily / Weekly
Ministry of Manpower (MO	Workplace Safety & Health Compliance	Entire workplace	WSH Officer / Coordinator	Continuous
	Risk Assessment (RA)	All maintenance activitie	Supervisor / WSH Personnel	Annual / Review
	Permit-To-Work (PTW)	High-risk works	Authorized Personnel	As required
	Work at Height Compliance	Roof / façade works	Competent Person	As required
	Confined Space Compliand	Tank / manhole works	Confined Space Assessor	As required
	Boiler	Tank	PE	Annual
	Gondola/Movable platform		PE	Annual
Other Statutory / Industry Requirements	Lift Maintenance	Lift systems	Authorized Lift Contractor	Monthly
	Generator Load Test	Emergency generator	LEW / Specialist Contractor	Monthly
	Cooling Tower Cleaning	Cooling tower	Specialist Contractor	Quarterly / Half-Yearly
	Gas Pipe Inspection	Gas system	Licensed Gas Service Worker (LGSW)	Annual / Periodic

Building and Construction Authority

An MND Statutory Board

Our Reference: APPBCA-2025-11 **Environmental Sustainability Group**

02 June 2025

See Distribution List

Dear Sir/Madam,

CIRCULAR ON THE IMPLEMENTATION OF MANDATORY ENERGY IMPROVEMENT REGIME

Objective

This circular is to update the industry on the new Mandatory Energy Improvement ("**MEI**") regime.

Background

2 On 10 Sep 2024, BCA mentioned in its media release that amendments have been made to the Building Control Act ("**BC Act**") to introduce the **MEI regime,** aimed at reducing energy consumption in energy-intensive buildings. The MEI regime will support the shift towards a low-carbon built environment, contributing to our national commitment to achieve net-zero emissions by 2050.

MEI Regime

3 Under the MEI regime, an official notice will be issued to owners of **energy-intensive buildings** with a Gross Floor Area (GFA) of 5,000 square metres or more that fall under any of these typologies:

(i) Commercial buildings;
(ii) Healthcare facilities;
(iii) Institutional buildings (comprising educational, civic, community and cultural buildings); and
(iv) Sports and recreation centres.

4 Owners of the buildings described in Paragraph 3 above will be required to:

(i) engage a qualified professional to conduct an energy audit of the building and its systems;
(ii) implement measures to reduce the building's energy consumption to meet specified targets; and
(iii) maintain the improved energy performance over a designated period.

52 Jurong Gateway Road #11- 01 Singapore 608550
Tel: 1800 3425 222 | Fax: (65) 6334 4287
www1.bca.gov.sg

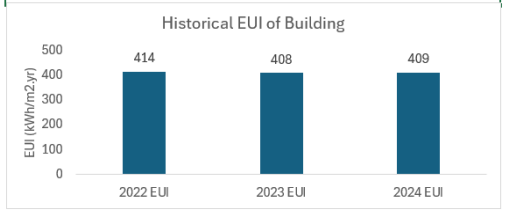
BuildSG

Building Use	Number of Buildings	EUI Ranges (kWh/m2.yr)			
		Top Quartile	2nd Quartile	3rd Quartile	Bottom Quartile
Hotel Buildings	79	≤200	200 - 245	245 - 311	>311
Office Buildings	228	≤111	111 - 144	144 - 182	>182
Retail Buildings	114	≤244	244 - 454	454 - 536	>536
Hospitals or Specialist Clinic	21	≤250	250 - 305	305 - 354	>354
Nursing Home	42	≤82	82 - 99	99 - 117	>117
Polyclinics or Private Clinic	12	≤130	130 - 152	152 - 191	>191
Autonomous University	11	≤92	92 - 136	136 - 170	>170
Civic Institution	23	≤73	73 - 102	102 - 168	>168
Community Institution	34	≤52	52 - 79	79 - 142	>142
Cultural Institution	9	≤177	177 - 201	201 - 226	>226
Other Educational Institution	16	≤55	55 - 82	82 - 126	>126
Recreation Club	41	≤134	134 - 208	208 - 289	>289
Sports Centre	11	≤33	33 - 89	89 - 163	>163

Mixed Development Customised Benchmark		Top Quartile	2nd Quartile	3rd Quartile	Bottom Quartile
to input for yellow cells below ↓		≤0	0 - 0	0 - 0	>0
Percentage of GFA for Function:					
Hotel	0%				
Office	0%				
Retail	0%				
Hospitals or Specialist Clinic	0%				
Nursing Home	0%				
Polyclinics or Private Clinic	0%				
Autonomous University	0%				
Civic Institution	0%				
Community Institution	0%				
Cultural Institution	0%				
Other Education Institution	0%				
Sports Centre	0%				
Recreation Club	0%				

Select Building Name

STUDIO M HOTEL



Summary of Building Energy Performance	
Building Name	STUDIO M HOTEL
Building Address	3 Nanson Road Singapore
Building Type	Hotel
2022 EUI	414
2022 EUI Quartile	Bottom Quartile
2023 EUI	408
2023 EUI Quartile	Bottom Quartile
2024 EUI	409
2024 EUI Quartile	Bottom Quartile

Ver 1.0 Sep 2024

Please indicate your premises type	Hotel

To note: Please ensure that your premises maintain all supporting documents (per notice part 4 ii) for the submitted data. These supporting documents will be subjected to audits. Failure to keep supporting documents (per notice part 4 ii) will result in non-compliance with Section 30(A) of the Environment Public Health Act 1987.

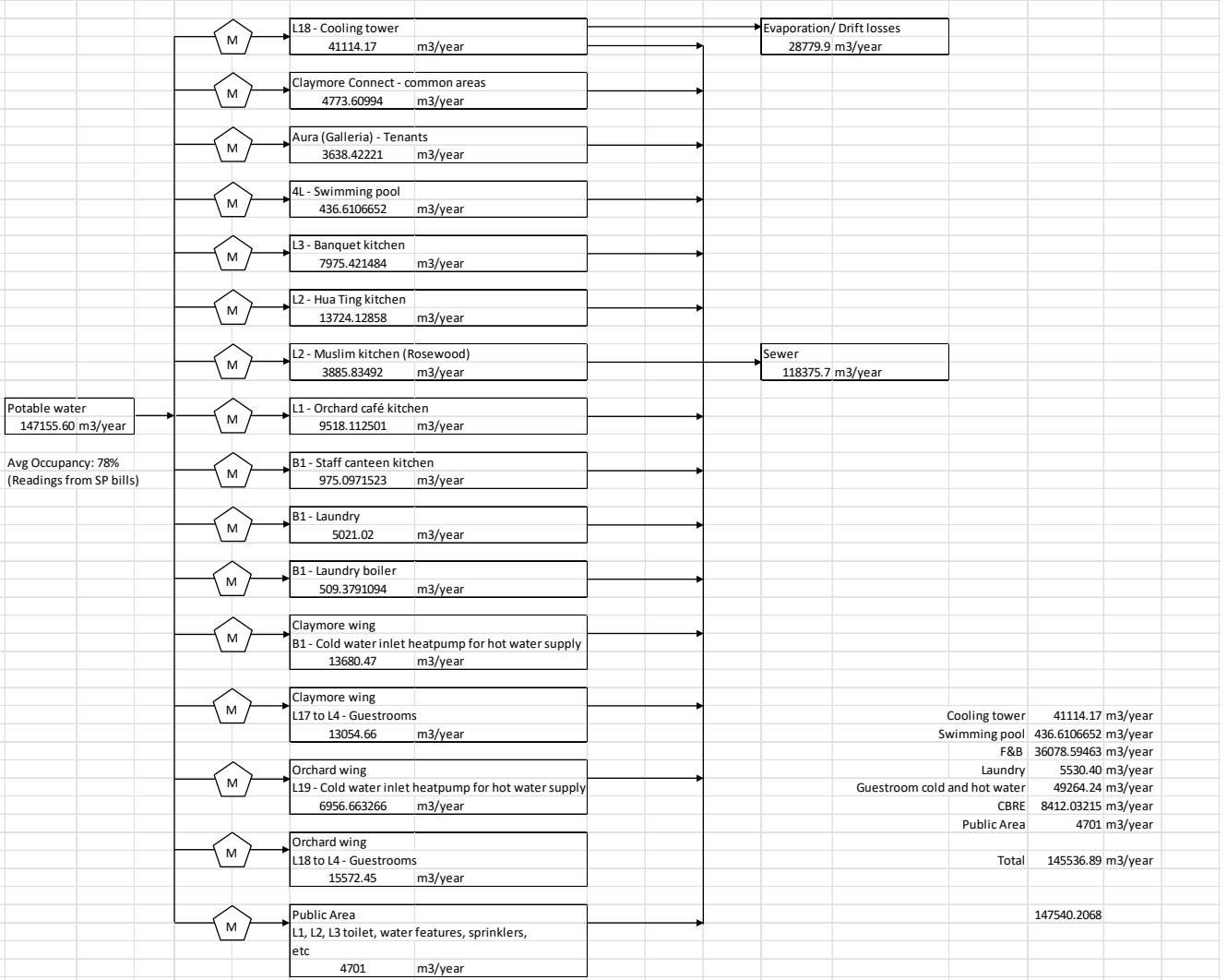
Blue cells are compulsory

Current Recycling Rate*	Proposed Recycling Rate* Target for Next Year	Other Relevant Information
9.1%	5.0%	ORCHARD HOTEL

**Recycling Rate = waste recycled/(waste disposed + waste recycled)*

Month			Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Subtotal	Total
Waste Disposed (kg)	General Waste (excluding toxic waste and used cooking oil)		70800	66210	58480	54960	58380	58440	66710	68820	62880	66930	67110	64830	764,550	764,550
Waste Recycled (kg)	Paper		2605	2530	2140	2640	2150	1970	1790	1700	1380	1600	1820	1660	23,985	76,832
	Metal		70	78	80	35	60	44	180	147	75	80	81	106	1,036	
	Plastic		66	51	60	50	45	37	90	130	32	64	31	39	695	
	Glass		0	0	0	0	0	160	160	90	80	156	165	120	931	
	Food		2281	6868	3378	2298	6281	1832	2772	4434	3749	3458	3263	3331	43,945	
	E-Waste		0	0	0	0	0	0	0	0	0	0	0	0	0	
	Bulky Items		0	0	0	0	3360	2870	0	0	0	0	0	0	6,230	
	Others	Wood	0	0	10	0	0	0	0	0	0	0	0	0	10	
															0	
															0	
															0	
															0	
															0	
															0	

Remarks:	
Paper	- includes cardboard boxes, paper drink cartons, office paper, newspapers, phone books, used envelopes, files, pamphlets/brochures, posters, magazines, junk mail, etc.
Metal	- includes both ferrous and non-ferrous metals (steel cans, containers, metal objects, aluminium cans and containers, tin cans, etc.)
Plastic	- include plastic drink bottles, detergent bottles, plastic bags, plastic wrappings, shrink wrap, etc.
Glass	- includes clear, brown, green etc. coloured bottles / containers / jars.
Food	- includes raw and cooked food wastes, but excludes used cooking oil. If there is any redistribution of surplus food, please provide details under "Other Relevant Information".
Wood	- includes pallets, wood chips, plywood, soft and hardwoods chipboard, MDF
Bulky Items	- includes furniture, large plastic containers, large metal containers


Potable water
147155.60 m3/year
Avg Occupancy: 78%
(Readings from SP bills)
M
L18 - Cooling tower
41114.17 m3/year
Evaporation/ Drift losses
28779.9 m3/year
Claymore Connect - common areas
4773.60994 m3/year
Aura (Galleria) - Tenants
3638.42221 m3/year
4L - Swimming pool
436.6106652 m3/year
L3 - Banquet kitchen
7975.421484 m3/year
L2 - Hua Ting kitchen
13724.12858 m3/year
L2 - Muslim kitchen (Rosewood)
3885.83492 m3/year
Sewer
118375.7 m3/year
L1 - Orchard café kitchen
9518.112501 m3/year
B1 - Staff canteen kitchen
975.0971523 m3/year
B1 - Laundry
5021.02 m3/year
B1 - Laundry boiler
509.3791094 m3/year
Claymore wing
B1 - Cold water inlet heatpump for hot water supply
13680.47 m3/year
Claymore wing
L17 to L4 - Guestrooms
13054.66 m3/year
Orchard wing
L19 - Cold water inlet heatpump for hot water supply
6956.663266 m3/year
Orchard wing
L18 to L4 - Guestrooms
15572.45 m3/year
Public Area
L1, L2, L3 toilet, water features, sprinklers, etc
4701 m3/year
Cooling tower 41114.17 m3/year
Swimming pool 436.6106652 m3/year
F&B 36078.59463 m3/year
Laundry 5530.40 m3/year
Guestroom cold and hot water 49264.24 m3/year
CBRE 8412.03215 m3/year
Public Area 4701 m3/year
Total 145536.89 m3/year
147540.2068

Operational Expenses

POMEC BUDGET 2025	JAN	%	FEB	%	MAR	%	APR	%	MAY	%	JUN	%	JUL	%	AUG	%	SEP	%	OCT	%	NOV	%	DEC	%	TOTAL
	SGD	Rev	SGD	Rev	SGD	Rev	SGD	Rev	SGD	Rev	SGD	Rev	SGD	Rev	SGD	Rev	SGD	Rev	SGD	Rev	SGD	Rev	SGD	Rev	SGD
PAYROLL & RELATED	77,583	100.0%	77,583	100.0%	77,583	100.0%	77,583	100.0%	77,583	100.0%	77,583	100.0%	89,383	100.0%	89,383	100.0%	89,383	100.0%	89,383	100.0%	89,383	100.0%	89,383	100.0%	1,001,792
BUILDING	11,827	4.0%	9,327	3.4%	9,327	3.2%	9,327	3.2%	12,202	4.3%	12,327	4.4%	34,327	12.2%	9,327	3.3%	9,327	3.3%	9,327	3.2%	12,202	4.2%	14,827	5.1%	153,672
CONTRACT SERVICES	127	0.0%	127	0.0%	130	0.0%	130	0.0%	130	0.0%	130	0.0%	130	0.0%	130	0.0%	130	0.0%	130	0.0%	130	0.0%	130	0.0%	1,558
DECORATIONS	3,000	1.0%	-	-	-	-	-	-	-	-	-	-	-	-	1,500	0.5%	-	-	-	-	-	-	3,000	1.0%	7,500
ELECTRICAL AND MECHANICAL EQUIPMENT	17,223	5.8%	16,882	6.2%	17,399	6.0%	16,914	5.7%	16,914	6.0%	17,414	6.2%	23,464	8.4%	23,464	8.4%	23,964	8.6%	29,971	10.4%	23,471	8.1%	16,971	5.9%	244,050
ELEVATORS AND ESCALATORS	20,528	6.9%	18,004	6.6%	18,568	6.4%	20,598	7.0%	18,774	6.7%	18,774	6.6%	20,598	7.3%	18,774	6.7%	18,774	6.7%	20,598	7.1%	18,774	6.5%	18,774	6.5%	231,540
ENGINEERING SUPPLIES	5,130	1.7%	5,130	1.9%	5,130	1.8%	5,130	1.7%	5,130	1.8%	5,130	1.8%	5,630	2.0%	5,630	2.0%	5,630	2.0%	5,630	1.9%	5,630	1.9%	5,630	1.9%	64,560
FLOOR COVERING	4,100	1.4%	4,100	1.5%	4,100	1.4%	4,100	1.4%	4,100	1.5%	4,100	1.4%	4,100	1.5%	4,100	1.5%	4,100	1.5%	4,100	1.4%	4,100	1.4%	4,100	1.4%	49,200
FURNITURE AND EQUIPMENT	5,300	1.8%	5,300	1.9%	5,300	1.8%	5,300	1.8%	5,300	1.9%	5,300	1.9%	21,800	7.8%	5,300	1.9%	5,300	1.9%	5,300	1.8%	5,300	1.8%	5,300	1.8%	80,100
GROUNDS MAINTENANCE AND LANDSCAPING	4,500	1.5%	4,500	1.6%	4,500	1.6%	4,500	1.5%	4,500	1.6%	4,500	1.6%	4,500	1.6%	4,500	1.6%	4,500	1.6%	4,500	1.6%	4,500	1.6%	4,500	1.6%	54,000
HEATING, VENTILATION, AND AIR CONDITIONING EQUIPMENT	26,301	8.9%	20,901	7.6%	20,901	7.2%	26,301	8.9%	20,901	7.4%	20,901	7.4%	26,301	9.4%	20,938	7.5%	21,012	7.5%	26,450	9.2%	21,050	7.3%	21,050	7.3%	273,007
KITCHEN EQUIPMENT	28,748	9.7%	15,748	5.7%	16,973	5.9%	13,398	4.6%	13,398	4.8%	24,123	8.5%	14,198	5.1%	17,198	6.2%	18,423	6.6%	14,333	5.0%	30,333	10.5%	21,058	7.3%	227,936
LAUNDRY EQUIPMENT	2,100	0.7%	1,300	0.5%	1,300	0.5%	2,250	0.8%	10,250	3.6%	8,750	3.1%	2,300	0.8%	1,500	0.5%	1,500	0.5%	2,500	0.9%	1,700	0.6%	1,700	0.6%	37,150
LICENSES AND PERMITS	4,700	1.6%	1,180	0.4%	1,180	0.4%	1,180	0.4%	1,640	0.6%	1,180	0.4%	1,180	0.4%	1,730	0.6%	1,200	0.4%	5,300	1.8%	1,200	0.4%	1,200	0.4%	22,868
LIFE/SAFETY	7,284	2.5%	11,594	4.2%	7,391	2.6%	7,091	2.4%	7,391	2.6%	7,391	2.6%	7,591	2.7%	11,501	4.1%	7,391	2.6%	11,091	3.8%	7,091	2.4%	7,391	2.5%	100,201
LIGHT BULBS	1,750	0.6%	1,750	0.6%	1,750	0.6%	2,200	0.7%	2,200	0.8%	2,200	0.8%	2,200	0.8%	2,200	0.8%	2,200	0.8%	2,200	0.8%	2,200	0.8%	2,200	0.8%	25,050
MISCELLANEOUS	300	0.1%	-	-	-	-	300	0.1%	300	0.1%	-	-	300	0.1%	-	-	-	-	300	0.1%	300	0.1%	-	-	1,800
PAINTING AND WALLCOVERING	2,700	0.9%	2,700	1.0%	2,700	0.9%	2,900	1.0%	2,900	1.0%	2,900	1.0%	3,150	1.1%	3,150	1.1%	3,150	1.1%	3,150	1.1%	3,150	1.1%	3,150	1.1%	35,700
PLUMBING	17,228	5.8%	11,228	4.1%	11,228	3.9%	11,528	3.9%	11,528	4.1%	11,528	4.1%	11,528	4.1%	11,528	4.1%	11,735	4.2%	11,735	4.1%	11,735	4.0%	11,735	4.0%	144,262
PRINTING AND STATIONERY	622	0.2%	622	0.2%	622	0.2%	722	0.2%	722	0.3%	722	0.3%	722	0.3%	722	0.3%	722	0.3%	722	0.2%	722	0.2%	722	0.2%	8,364
SWIMMING POOL	2,550	0.9%	2,150	0.8%	2,650	0.9%	2,150	0.7%	2,550	0.9%	2,250	0.8%	2,550	0.9%	2,150	0.8%	2,294	0.8%	2,594	0.9%	2,194	0.8%	2,694	0.9%	28,774
TELECOMMUNICATION	640	0.2%	640	0.2%	640	0.2%	640	0.2%	640	0.2%	640	0.2%	640	0.2%	640	0.2%	640	0.2%	640	0.2%	640	0.2%	640	0.2%	7,680
TRAVEL—MEALS AND ENTERTAINMENT	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2,000	0.7%	2,000
UNIFORM COSTS	400	0.1%	450	0.2%	400	0.1%	450	0.2%	400	0.1%	450	0.2%	400	0.1%	450	0.2%	400	0.1%	450	0.2%	400	0.1%	450	0.2%	5,100
UNIFORM LAUNDRY	700	0.2%	700	0.3%	700	0.2%	700	0.2%	700	0.2%	700	0.2%	700	0.2%	700	0.3%	700	0.2%	700	0.2%	700	0.2%	700	0.2%	8,400
WASTE REMOVAL	9,700	3.3%	9,700	3.5%	9,700	3.4%	10,000	3.4%	10,000	3.5%	10,000	3.5%	10,000	3.6%	10,000	3.6%	10,000	3.6%	10,000	3.5%	10,000	3.4%	10,000	3.4%	119,100
TOTAL OTHER EXPENSES	177,458	60.0%	144,032	52.5%	142,590	49.4%	147,810	50.2%	152,571	54.1%	161,411	57.1%	198,310	70.7%	157,132	56.3%	153,093	54.6%	171,722	59.4%	167,523	57.8%	159,923	55.2%	1,933,572
ELECTRICITY	255,403		233,445		247,131		248,417		235,673		236,043		233,218		231,402		232,064		243,148		243,621		243,103		2,882,667
GAS	-		-		-		-		-		-		-		-		-		-		-		-		-
WATER/SEWER	40,437		40,837		41,237		45,887		46,328		46,769		47,210		47,651		48,093		45,887		46,328		46,769		543,432
TOTAL UTILITY EXPENSES	295,839		274,282		288,368		294,304		282,000		282,812		280,428		279,053		280,156		289,035		289,949		289,872		3,426,099

Supplier	PR NO.	PO No.	PO Date	GL Code	Product Description	Amount	Invoice	Transmittal Ref.
					MONTHLY MAINTENANCE CONTRACT & SERVICING FEE FOR SWIMMING POOL, JACUZZI POOL, WATER FOUNTAIN & FILTRATION ROOM FOR THE MONTH OF APRIL 2026			
DAIKIN	OHSR26006276	OHSO26011734	9/4/2026	725211	RECOVERY PO - DAIKIN MAINTENANCE CONTRACT FOR GENERAL SERVICING & MAINTENANCE FOR THE MONTH OF 01 APRIL 2026 SERVICING	$ 2,520.00	8700350972	T012/26
DECOND	OHSR26006278	OHSO26011755	9/4/2026	725211	RECOVERY PO - TO SUPPLY LABOUR, TOOLS AND MATERIALS TO NORMAL SERVICING FOR 4 NOS COOLING TOWER AT CLAYMORE WING ROOFTOP MAINTENANCE CONTRACT APRIL 2026	$ 1,280.00	26-09545	T011/26
ELV	OHSR26006279	OHSO26011735	9/4/2026	725270	RECOVERY PO - NON-COMPREHENSIVE MONTHLY MAINTENANCE OF PA/EVC/BGM AND FI SYSTEM AT CLAYMORE/ORCHARD WING AND CLAYMORE CONNECT (PERIOD: APRIL 2026)	$ 1,620.00		
FIRE MECH	OHSR26006280	OHSO26011618	8/4/2026	725270	RECOVERY PO - FIRE PROTECTION SYSTEM SERVICE & MAINTENANCE CONTRACT FOR SEASONS VIEW @ ORCHARD HOTEL SINGAPORE APRIL 2026	$ 333.33		
HVS	OHSR26006283	OHSO26011741	9/4/2026	725211	RECOVERY PO - FOR MAINTENANCE SERVICE FOR HVS AUTO CLEANING SYSTEM (QUATERLY, NON-COMPREHENSIVE)-APRIL 2026	$ 2,092.00		
KONE	OHSR26006284	OHSO26011736	9/4/2026	725150	RECOVERY PO - KONE MAINTENANCE CONTRACT FOR MONTHS OF APRIL 01/04/2026 TO 30/04/2026	$ 12,502.00	982334024	T012/26
NCH	OHSR26006285	OHSO26011825	9/4/2026	725211	RECOVERY PO - NCH COOILING TOWER CONTRACT EA & APC BILLING FOR MONTH OF APRIL 2026	$ 844.00		
NCH	OHSR26006286	OHSO26011737	9/4/2026	725232	RECOVERY PO - NCH BIOAMP SERVICING CONTRACT APRIL 2026	$ 2,320.00		
OTIS	OHSR26006288	OHSO26011738	9/4/2026	725150	RECOVERY PO - MAINTENANCE FEE FOR 4 ESCALATOR SERVICES APRIL 2026	$ 4,432.00		
RELIANCE	OHSR26006289	OHSO26011739	9/4/2026	725232	RECOVERY PO - RELIANCE KITCHEN SERVICING CONTRACT FOR APRIL 2026	$ 4,500.00		
ZERO WASTE	OHSR26007291			725400	ADHOC - FOOD WASTE RECYCLING EQUIPMENT SERVICE AND MAINTENANCE - APRIL 2026	$ 525.00		
					Total Maintenance :	**$ 43,275.83**		

Apr 26 | Maintenance | Manpower | Pending Invoice | +

Supplier	PR NO.	PO No.	PO Date	GL Code	Product Description	Amount	Invoice	Transmittal Ref.
RELIANCE	OHSR26006847	OHSO26012725	20/4/2026	725232	20256743 - ORCHARD CAFE KITCHEN AIR BLAST KWALI RANGE	$ 190.00		
RELIANCE	OHSR26006848	OHSO26013262	22/4/2026	725232	20256744 - LEVEL 2 HUATING KITCHEN AIR BLAST KWALI RANGE NO. 4	$ 685.00		
RELIANCE	OHSR26006849	OHSO26013263	22/4/2026	725232	20256745 - ORCHARD CAFE KITCHEN MOFFAT GAS HOT PLATE GRIDDLE	$ 1,860.00		
RELIANCE	OHSR26006850	OHSO26012943	20/4/2026	725232	20256746 - LEVEL 3 BANQUET KITCHEN HOBART FLIGHT TYPE DISHWASHER	$ 300.00		
RELIANCE	OHSR26006852	OHSO26013264	22/4/2026	725232	20256748 - ORCHARD CAFE KITCHEN MOFFAT GAS HOT PLATE GRIDDLE	$ 580.00		
RELIANCE	OHSR26006855	OHSO26013052	21/4/2026	725232	20257536 - ROOM SERVICE 2 DOOR COUNTER CHILLER RS-CH01	$ 370.00		
SARAH	OHSR26005004	OHSO26011834	9/4/2026	725139	SEQ250351 - TO SUPPLY ABB S202M-B32 DP 32A 10KA *B* MCB, TO SUPPLY ABB F202 AC-40/0.03 DP 40A 30MA RCCB, TO SUPPLY MAXSPID KLMW5100 W/P EXIT LIGHT, TO SUPPLY SINGLE GANG ONIOFF SWITCH, TO SUPPLY AND INSTALL SS 304 KITCHEN STANDING SINK ESTIMATED 550MM X 450MM X 850MM AND SINK DEPTH 250MM	$ 2,049.00	SEQ02230	T012/26
SARAH	OHSR26005001	OHSO26011775	9/4/2026	725211	SEQ250369 - GUEST ROOM FCU MOTORIZED VALVE REPLACE FOR THE ROOM 406, REMOVE THE INSULATION COVER WITH JACKETING AND OPEN THE EXISTING FAULTY MOTORIZE VALVE AND ACTUATOR. INSTALL NEW MOTORIZE VALVE WITH VIBRATION CONTROLLED FLEXIBLE PIPE AND NEW ACTUATOR.	$ 1,500.00	SEQ02229	T012/26
SARAH	OHSR26006429	OHSO26011828	9/4/2026	725116	SEQ260163 - TO SUPPLY MATERIALS, TOOLS AND TRANSPORTATION FOR SEGMENT 2 FOR THE CANOPY WORKS AT ORCHARD WING ROOFTOP ABOVE HEAT TANK AT ORCHARD WING ROOF CANOPY	$ 4,200.00	SEQ02228	T012/26
SARAH	OHSR26005002	OHSO26013269	22/4/2026	725211	SEQ250370 - GUEST ROOM FCU MOTORIZED VALVE REPLACE FOR THE ROOM 426, REMOVE THE INSULATION COVER WITH JACKETING AND OPEN THE EXISTING FAULTY MOTORIZE VALVE AND ACTUATOR. INSTALL NEW MOTORIZE VALVE WITH VIBRATION CONTROLLED FLEXIBLE PIPE AND NEW ACTUATOR.	$ 1,500.00		
SARAH	OHSR26007104	OHSO26013270	22/4/2026	725116	SEQ250748 - TO SUPPLY AND INSTALL SS WALL PANEL AT L3 CORRIDOR	$ 1,600.00		
SARAH	OHSR26007105	OHSO26013271	22/4/2026	725310	SEQ250749 - TO SUPPLY AND INSTALL SS WALL PANEL AT BALLROOM BEHIND SERVICE CORRIDOR	$ 2,100.00		
SARAH	OHSR26007107	OHSO26013272	22/4/2026	725330	SEQ250794 - TO SUPPLY AND REPLACE DRAIN PIPE AT B2 DECK CAR PARK	$ 1,200.00		
SARAH	OHSR26007110	OHSO26013273	22/4/2026	725180	SEQ250843 - SUPPLY AND INSTALL INDUCTION STOVE FOR GM UNIT	$ 2,000.00		
SARAH	OHSR26007175			725116	SEQ260180 - L3 MALE TOILET DOOR REPAIR WITH REPLACEMENT LOCK	$ 330.00		
UNFLOW	OHSR26004433	OHSO26011819	9/4/2026	725232	UE/3805/26 - WELDING TOC KITCHEN TABLE CHILLER DOOR	$ 550.00	12127	T012/26
TEMA	OHSR26004629	OHSO26011804	9/4/2026	725232	TM/8770/26 - TO PROVIDE LABOUR, TOOLS AND MATERIALS TO REPLACE LEAKING PIPE AT BANQUET KITCHEN AND REPAIR TOC WESTERN DEEP FRYER STEEL DOOR.	$ 600.00	12020	T012/26
TEMA	OHSR26004689	OHSO26011818	9/4/2026	725232	TM/8723/26 – TO PROVIDE LABOUR, TOOLS AND MATERIALS TO REPLACE LEVEL 3 BANQUET ICE MACHINE BROKEN LEG AND WELDING BANQUET KITCHEN DISWASHER S/STEEL DRAIN COVER STRAINER	$ 500.00	12021	T012/26
TEMA	OHSR26004690	OHSO26013243	22/4/2026	725116	TM/8725/26 – TO PROVIDE LABOUR, TOOLS AND MATERIALS TO REPAIR LEVEL 2 MEETING ROOM DOOR LOCK AND LEVEL 3 BALLROOM BACK DOOR S/STEEL DOOR	$ 500.00		
TEMA	OHSR26004691	OHSO26013265	22/4/2026	725232	TM/8726/26 – TO PROVIDE LABOUR, TOOLS AND MATERIALS TO FABRICATE AND WEL S/STEEL DOOR LATCH FOR WARMER DOOR AND TOC ICE MACHINE	$ 600.00		
TEMA	OHSR26004692	OHSO26013266	22/4/2026	725232	TM/8727/26 - TO PROVIDE LABOUR, TOOLS AND EQUIPMENT TO REPAIR AND WELDING S/STEEL LOUVRE FOR TOC COFFEE MACHINE CABINET DOOR AND HUA TING KITCHEN TIMSUM SECTION 2 S/STEEL RINGS	$ 600.00		
TEMA	OHSR26004805	OHSO26012726	20/4/2026	725232	TM/8728/26 – TO PROVIDE LABOUR, TOOLS AND MATERIALS TO REPAIR WELDING S/STEEL DOOR LATCH ABD DOOR HINGES FOR LEVEL 1 FOOD WARMER	$ 350.00	12025	T012/26
TEMA	OHSR26004807	OHSO26012738	20/4/2026	725232	TM/8729/26 – TO PROVIDE LABOUR, TOOLS AND MATERIALS TO REPAIR LEAKING PIPE AT L3 PASTRY AND LEVEL 3 BANQUET KITCHEN BASIN WATER TAP	$ 450.00	12026	t012/26
TEMA	OHSR26004809	OHSO26013244	22/4/2026	725232	TM/8730/29 - TO PROVIDE LABOUR, TOOLS AND EQUIPMENT TO WELDING 3 NOS LEVEL 3 KITCHEN BAKERY MIXER S/STEEL ARMS AND 2 NOS BALLROOM PARTITIONS HANDLES	$ 500.00		
					Total PR Approved:	**$ 82,356.71**		

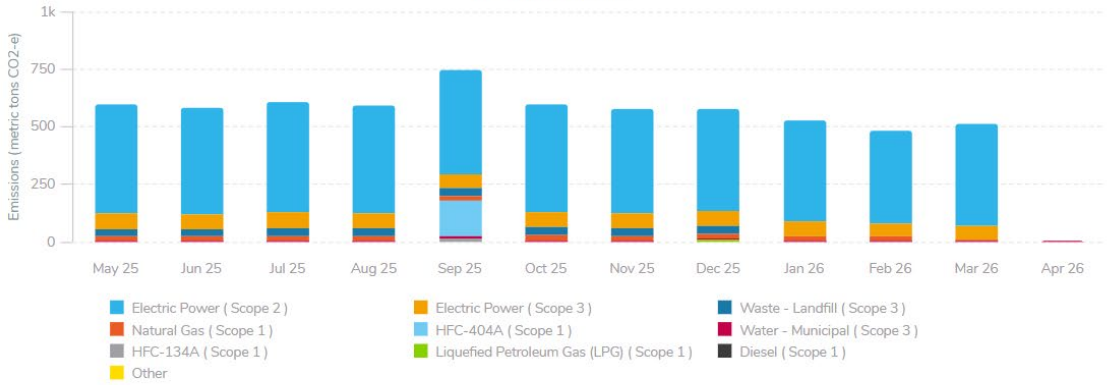
Apr 26 | Maintenance | Manpower | Pending Invoice | +

Energy Monitoring

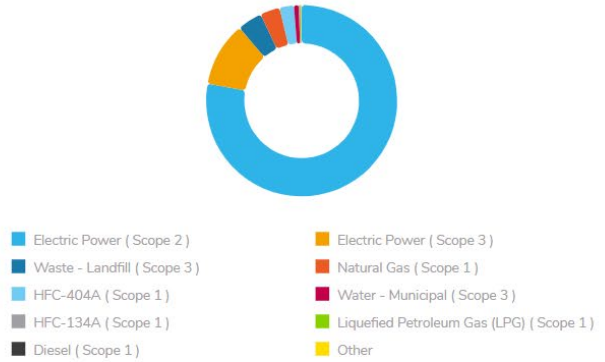
Emissions Details Report

Primary: CDL Carbon Report - LB(Location-based) | Last 1 Year | Monthly | View Options

View - By Data Stream



View - By Data Stream


Electric Power (Scope 2)
Electric Power (Scope 3)
Waste - Landfill (Scope 3)
Natural Gas (Scope 1)
HFC-404A (Scope 1)
Water - Municipal (Scope 3)
HFC-134A (Scope 1)
Liquefied Petroleum Gas (LPG) (Scope 1)
Diesel (Scope 1)
Other

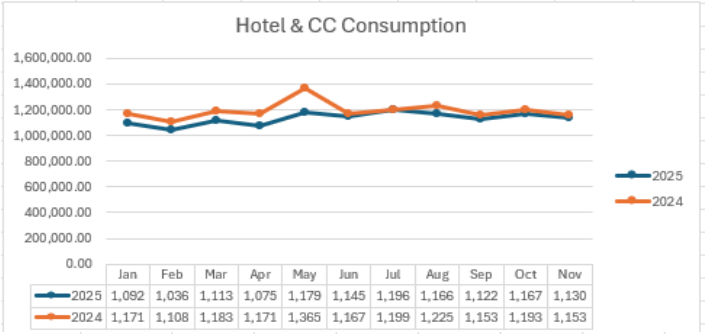
2025

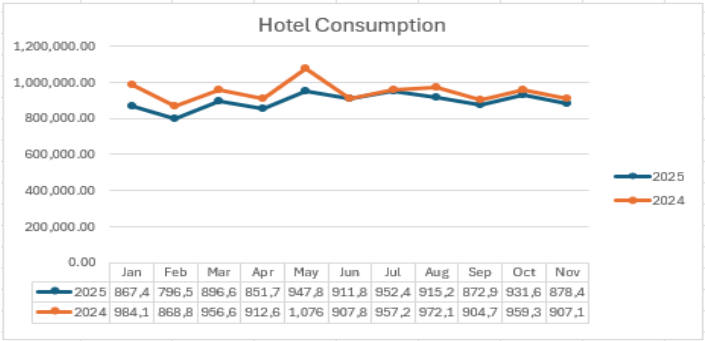
Month	Hotel Total Consumption		Hotel Only		CC Only		CC CA only	CC Tenat only	Occupancy
	kWh	$	kWh	$	kWh	$	kWh	kWh	
Jan	1,092,565.92	$247,146.75	867,436.53	$204,484.98	225,129.39	$42,661.77	34,580.56	190,548.83	75.65%
Feb	1,036,317.80	$236,851.38	796,523.98	$172,950.25	239,793.82	$63,901.13	49,192.53	190,601.29	74.15%
Mar	1,113,472.22	$251,048.98	896,698.65	$195,345.30	216,773.57	$55,703.68	42,410.65	174,362.92	63.70%
Apr	1,075,924.98	$240,785.47	851,732.62	$195,432.96	224,192.36	$45,352.51	32,517.19	191,675.17	65.32%
May	1,179,801.28	$259,857.26	947,870.91	$207,059.00	231,930.38	$52,798.26	41,298.28	190,632.09	71.59%
Jun	1,145,923.35	$255,638.14	911,800.96	$198,579.42	234,122.39	$57,058.72	38,634.56	195,487.83	63.99%
Jul	1,196,632.89	$265,151.33	952,446.26	$213,113.61	244,186.63	$52,037.72	34,232.79	209,953.84	91.20%
Aug	1,166,830.68	$259,670.43	915,281.39	$195,536.55	251,549.29	$64,133.88	42,478.92	209,070.37	93.90%
Sep	1,122,147.39	$251,350.81	872,932.28	$183,780.91	249,215.11	$67,569.90	39,209.66	210,005.45	80.50%
Oct	1,167,557.09	$259,889.37	931,647.88	$206,238.08	235,909.21	$53,651.29	30,756.20	205,153.01	82.90%
Nov	1,130,942.97	$253,033.32	878,468.10	$195,988.39	252,474.86	$57,044.93	39,795.36	212,679.50	87.50%
Dec			0.00		0.00	$0.00			
	12,428,116.56		9,822,839.56		2,605,277.00				

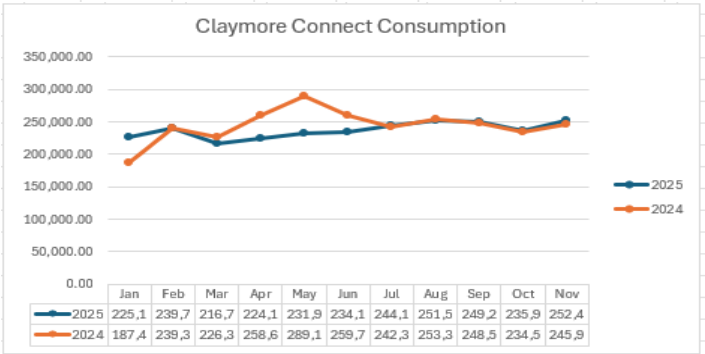
2024

Month	Hotel Total Consumption		Hotel Only		CC Only		CC CA only	CC Tenat only	Occupancy
	kWh	$	kWh	$	kWh	$	kWh	kWh	
Jan	1,171,641.00	$334,138.66	984,192.00	$267,523.12	187,449.00	$66,615.54	69,300.49	118,148.51	83.20%
Feb	1,108,237.00	$317,393.93	868,844.80	$251,690.24	239,392.20	$65,703.69	38,372.15	201,020.05	82.49%
Mar	1,183,060.00	$337,924.42	956,660.10	$266,390.15	226,399.91	$71,534.27	35,931.72	190,468.19	80.58%
Apr	1,171,348.85	$328,019.23	912,684.40	$273,496.59	258,664.45	$54,522.64	49,313.72	209,350.73	71.96%
May	1,365,202.00	$342,062.44	1,076,028.05	$288,876.81	289,173.95	$53,185.63	61,213.03	227,960.92	70.76%
Jun	1,167,591.11	$327,033.03	907,876.86	$215,399.00	259,714.26	$111,634.03	44,562.02	215,152.23	70.52%
Jul	1,199,583.00	$337,321.66	957,257.79	$273,675.38	242,325.21	$63,646.28	39,323.22	203,002.00	85.60%
Aug	1,225,477.00	$339,508.34	972,120.97	$273,205.65	253,356.03	$66,302.69	42,493.55	210,862.48	86.75%
Sep	1,153,386.00	$322,636.30	904,792.43	$256,341.34	248,593.57	$66,294.96	44,256.32	204,337.25	78.95%
Oct	1,193,946.00	$334,674.14	959,368.63	$258,143.98	234,577.37	$76,530.16	37,615.43	196,961.94	74.02%
Nov	1,153,096.15	$323,762.68	907,152.63	$246,602.01	245,943.53	$77,160.67	45,727.01	200,216.51	76.92%
Dec	1,181,455.31	$326,790.07	947,519.62	$268,370.40	233,935.69	$58,419.67	42,733.61	191,202.08	74.06%
	14,274,023.42		11,354,498.27		2,919,525.15				

Energy Used Intensity (EUI)					
GFA		2023	2024	2025	GFA %
Total	49900	271.80	286.05	249.06	100.00%
Hotel	41076	262.43	276.43	239.14	78.52%
CC	8824	315.44	330.86	295.25	21.48%
		273.8144	288.1204	251.192	







										UTILITIES								
195,988	2.6%	231,604	3.0%	(35,615)	(15.4%)	246,602	3.5%	(50,614)	(20.5%)	Electricity	2,168,510	3.1%	2,458,551	3.1%	(290,041)	(11.8%)	2,871,344	3.8%	(702,834)	(24.5%)
44,852	0.6%	44,485	0.6%	367	0.8%	29,709	0.4%	15,144	51.0%	Water/Sewer	401,771	0.6%	464,180	0.6%	(62,410)	(13.4%)	379,679	0.5%	22,092	5.8%
240,841	3.2%	**276,089**	3.5%	**(35,248)**	(12.8%)	**276,311**	3.9%	**(35,470)**	(12.8%)	**TOTAL UTILITY EXPENSES**	**2,570,281**	3.7%	**2,922,731**	3.7%	**(352,450)**	(12.1%)	**3,251,023**	4.3%	**(680,743)**	(20.9%)
										Energy Statistics								
1,126,222		1,240,565		(114,343)	(9.2%)	1,153,096		(26,874)	(2.3%)	Electrical—KWH	12,364,303		13,418,829		(1,054,526)	(7.9%)	13,092,568		(728,265)	(5.6%)
-		-		-	-	-		-	-	Gas—KWH	-		-		-	-	-		-	-
-		-		-	-	-		-	-	Steam—Metric Ton	-		-		-	-	-		-	-
13,944		13,730		214	1.6%	11,802		2,142	18.2%	Water/Sewer—Cubic Metres	140,511		150,817		(10,306)	(6.8%)	145,293		(4,782)	(3.3%)
-		-		-	-	-		-	-	Chilled Water—Rton	-		-		-	-	-		-	-

Vendor Activities

Required Document	Purpose	Sample / Key Contents
Risk Assessment (RA)	Identify hazards and control measures before work starts	• Scope of work • Hazard identification • Risk level • Control measures • PPE requirements • Emergency procedures
Safe Work Procedure (SWP)	Define step-by-step safe work execution	• Work sequence • Tools/equipment used • Isolation procedu Safety precautions • Permit-to-Work requirements
Method Statement (MS) *(Optional / High Risk Wo*	Detailed technical execution plan	• Work methodology • Sequence of activities • Manpower allocation • Equipment & testing procedures
Insurance Certificate	Ensure contractor insurance coverage validity	• Work Injury Compensation Insurance (WICI) • Public Liability Insurance • Contractor All Risk (CAR)
Workers Name List	Verify authorized personnel entering site	• Full name • NRIC/FIN • Company name • Designation • Contact number
Safety Certifications	Ensure workers are properly trained	• CSOC / SSIC • Work at Height • Confined Space • Lifting Supervisor / Rigger
Permit-To-Work (PTW)	Control high-risk activities	• Hot work • Work at height • Confined space • Electrical shutdown
Equipment Certificates	Verify equipment safety compliance	• Lifting equipment certificates • Calibration certificates • Scaffolding tags
Emergency Contact List	Emergency response preparedness	• Supervisor contact • Safety officer • Site in-charge • Emergency hotline
Work Schedule / Timeline	Coordinate operational impact	• Date/time of work • Shutdown period • Area affected • Completion target

Sustainability

What is Sustainability?

Sustainability means meeting the needs of the present without compromising the ability of future generations to meet their own needs.

In simple terms, sustainability means:

- Using resources responsibly
- Reducing waste and carbon emissions
- Improving efficiency
- Protecting the environment
- Creating long-term value for society and businesses

What is the Singapore Green Plan 2030?

The Singapore Green Plan 2030 is Singapore's national sustainability movement and roadmap that aims to advance the country's sustainable development agenda over the next decade.

It was launched by the Singapore Government to:

- Combat climate change
- Reduce carbon emissions
- Improve energy and water efficiency
- Create a greener and more sustainable future
- Support Singapore's commitment to the Paris Agreement and net-zero ambitions

The Green Plan 2030 involves multiple government agencies, industries, businesses, and the public working together towards sustainability goals.

Sustainability in Buildings & Hotels in Singapore

For hotels and commercial buildings, sustainability commonly means:

Sustainability Area	Examples
Energy Efficiency	Efficient chiller plant, LED lighting, VSD systems
Water Efficiency	Water-saving fittings, cooling tower optimization
Waste Reduction	Recycling programs, food waste reduction
Indoor Environmental Quality	Good IAQ, fresh air management
Green Building Certification	BCA Green Mark
Carbon Reduction	Lower electricity consumption and emissions
Smart Building Systems	BMS, AI optimization, energy monitoring
Preventive Maintenance	Maintaining equipment efficiency

What Green Plan 2030 Means for Buildings & Hotels

Energy Efficiency

- Improve chiller plant efficiency
- Use energy-saving systems
- Reduce electricity consumption

Water Conservation

- Reduce water usage
- Improve cooling tower efficiency
- Install water-efficient fittings

Green Buildings

- Achieve BCA Green Mark certification
- Adopt sustainable building practices
- Improve indoor environmental quality

Waste Reduction

- Recycling programs
- Food waste reduction
- Sustainable purchasing

Smart Technology

- AI-driven building optimization
- Smart sensors and BMS systems
- Energy monitoring systems

Why Green Plan 2030 is Important in Singapore

Singapore has:

- Limited land
- Limited natural resources
- High urban density
- Heavy dependence on imported energy and water

The Green Plan helps Singapore become:

- More sustainable
- More energy-efficient
- More climate-resilient
- Less dependent on resources

Examples in Engineering & Facilities Management

Area	Example
ACMV	Chiller optimization
Lighting	LED conversion
Water	Low-flow fixtures
Electrical	Smart energy monitoring
Waste	Recycling management
Maintenance	Preventive maintenance to improve efficiency

Green Plan 2030 Targets (Examples)

Target	**Goal**
Green Buildings	80% of buildings to be green by 2030
Solar Energy	Increase solar deployment
Waste Reduction	Reduce landfill waste
Cleaner Energy	Reduce carbon emissions
Sustainable Transport	More EV infrastructure

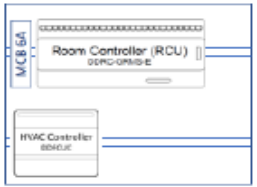
Implemented Initiative

Guest Room Smart System

Signify Classified - Internal

Propose RCU Controls

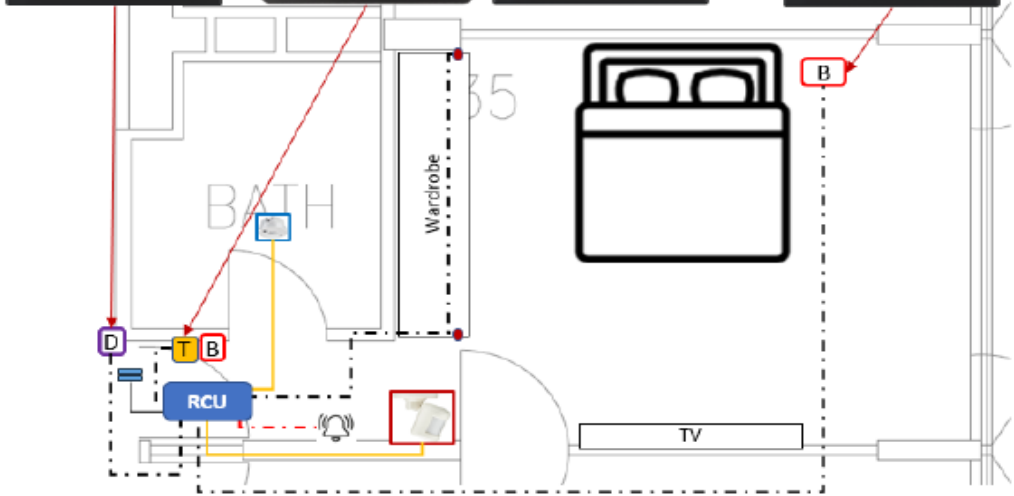
RCU Panel



Approx. Width 350mm x Height 400mm x Depth 100mm

Panels selection are still tentative

Combine with Custom made Standing Back Box - TBC



New Cat6 FTP

New Cable 2-wire

Existing Power Wire

Existing Data Wire

Wall Mounted Sensor for Bedroom

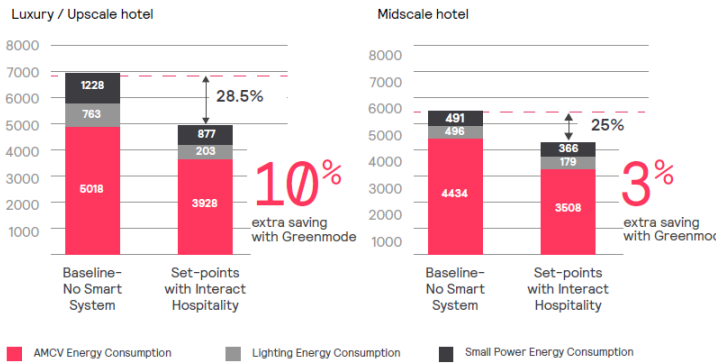
New Components	
C	Doorbell Panel
T	Thermostat Panel
B	Button Panel
	PIR Sensor DUS360CR
	PIR Sensor DUS90CS
	Door Reed Switch

Note:
Integration with FCU PWM mode needs to be checked with Trane if they can insert 3-Speed Module for a direct High/Medium/Low Relay Control from RCU
Existing Wiring will need to be checked if suitable. Visual Check seems ok
Request from Hotel to have Temperature/Humidity Sensors near the Bed

Guest Room Smart System

5.3. Expected Annual Energy Savings

Total annual energy savings per guest room with Interact Hospitality



Results

Below is a summary of the results:

Category	Full power	Energy saving	Savings
Base Power	0.49 kWh	0.4 kWh	-19%
Lighting	0.53 kWh	0.0 kWh	-100%
HVAC	6.24 kWh	0.19 kWh	-96.9%
TOTAL	**7.26 kWh**	**0.59 kWh**	**-91.8%**

Comments

1. The occupancy-based logic would allow for significant reduction in the energy consumption of the main power consumption category – i.e., the HVAC, reducing the consumption by 96.8%.
2. Lighting would drop by 100% as all lights would be switched off when the room is unoccupied.
3. Further, marginal savings on other items (Base Power), such as TV, could also be achieved through the same logic. For the purpose of this test, the Base Power was set to a reference level of 550W occupied vs. 50W unoccupied. This can be adjusted with actual values based on device consumption.

Overall, the occupancy-based logic would lead to considerable savings.

EC Motor with IoT

Retrofit 1-2-3

Step 1

1st Measurement

- 1st measurement from the energy consumption before retrofit.

Step 2

2nd Measurements

- 2nd measurement will be taken after retrofitting with the EC Fans..

Step 3

3rd Measurements

- After retrofitting with EC Fans, we will measure the energy consumption of the EC Fans after implementing the IoT Solutions.
- We will trend this energy consumption data

1. Equipment name
2. Actual speed
3. Total power (in kW)
   - or cooling capacity in kW/ton
4. Touch for Individual fan status
5. Control source
6. Date & timestamp
7. Set speed
8. Start/Stop
9. Fan animation

Select the fan type for your application

Optional: Add a video camera for fan overview

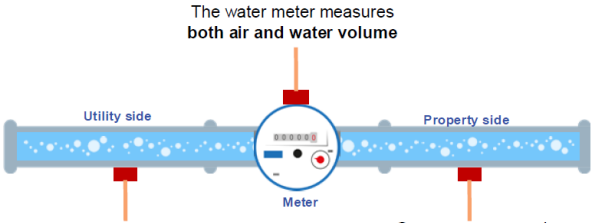
EC Motor with IoT

Without IOT										
		Airflow	TSP	Motor			Input power	Saving	Total Price	ROI
S/No	Tag	CMH	PA	KW	Model number	Quantity	KW	%	SGD	Years
1	AHU 1-1 (Restaurant)	15000	1300	11	K3G450PA3103	2	7.48	32%	16400	2.66
2	AHU 1-3 (BI)	7500	1300	5.5	K3G450PA3103	1	3.74	32%	13700	4.44

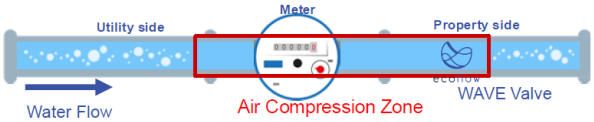
With IOT											
		Airflow	TSP	Motor			Input power	Saving	IOT	Total Price	ROI
S/No	Tag	CMH	PA	KW	Model number	Quantity	KW	%	Sub Total Price	SGD	Years
1	AHU 1-1 (Restaurant)	10000	1300	11	K3G450PA3103	2	3.85	65%	12100	28500	2.28
3	AHU 1-3 (BI)	7500	1300	5.5	K3G450PA3103	1	1.925	65%	12100	25800	4.12

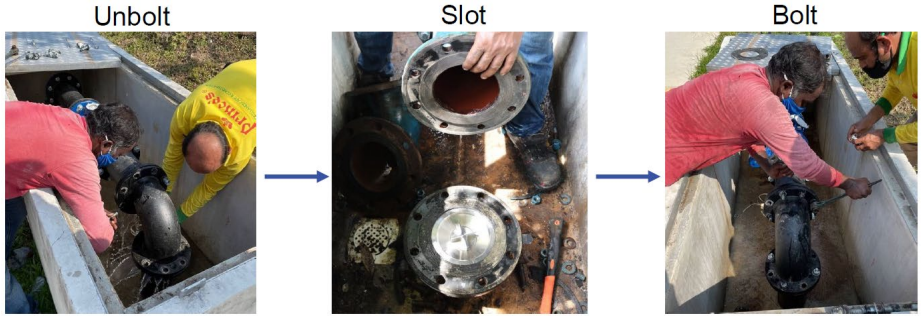
Eco Flow Valve

Problem: Current Infrastructure



Problem: Solution





Post Implementation

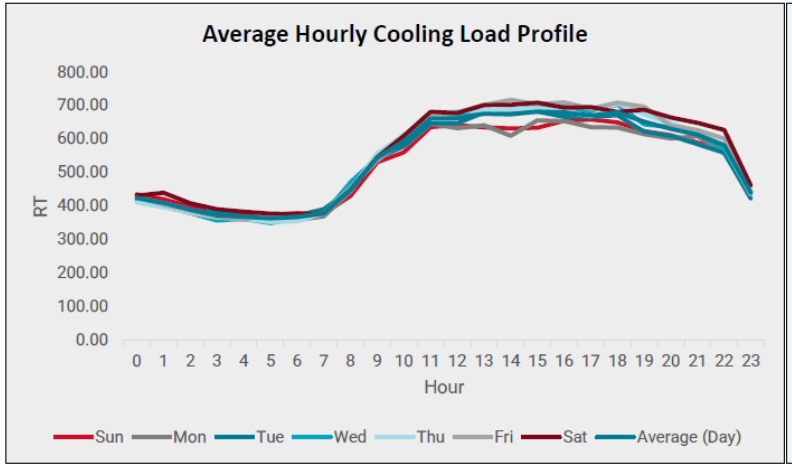
Targeted savings rate: 15% from current monthly water bills

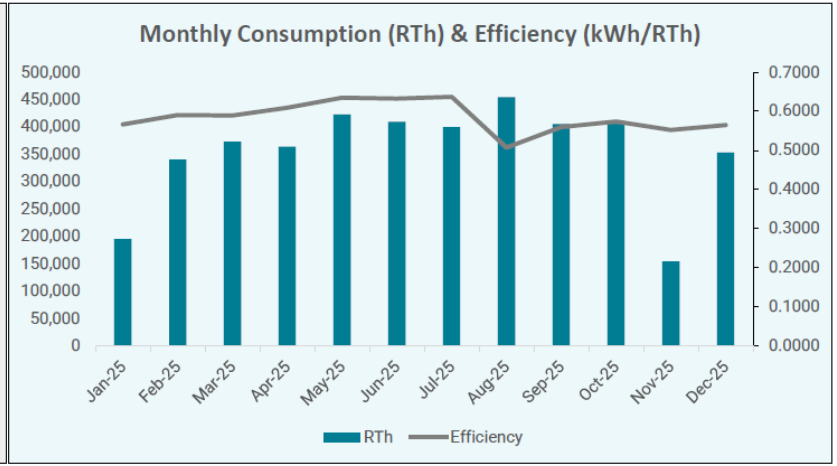
Method: Comparison of average adjusted water consumption (CuM) per adjusted occupancy level (%) before and after installation

Data used: Monthly water bills from Jan-25 to Dec-25

Trial KPI: Adjusted water consumption (CuM)/ adjusted occupancy level (%)		
Occupancy level (%)	Benchmark [Pre – Installation]	Targeted [Post – Installation]
70 - 80%	11,500 - 12,000 M3	9,800 – 10.200
> 80%	13,000 – 13,800 M3	11,100 - 11,800 Estimated Savings ~ $6,100 to $6,480/month Payback period ~10months

Cooling Load Baselining for Jan – Dec 2025





- 1-year Cooling load*: 4,672,343 RTh @ 0.587 kWh/RTh
- Operation Hours During Weekdays/Weekends: 24 hours
- Efficiency:
  - Max: 0.637 kW/RT
  - Min: 0.508 kW/RT
  - Avg: 0.587 kW/RT

Baseline Case	
Total RTh	4,672,343
Avg. Eff, kWh/RTh	0.587

*Note: Jan '25 and Nov '25 each have only 15 days of data due to BMS error (thus the lower RTh). Annual RTh is extrapolated from 11 months actual data.

Chiller Optimization

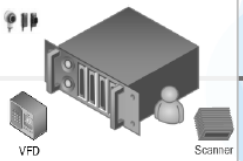
Unlocking Value: How DPC enables to deliver results

Boundary Limit - Seamless & Secure Integration with BMS

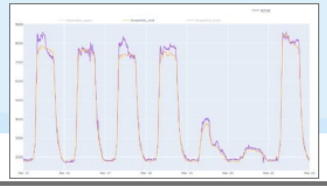
BMS/CPA Vendor[1]

Secured Data

Data from controls & edge devices



AI/ML Based Optimization and FDD "Digital Twin"



Insights & Recommendations

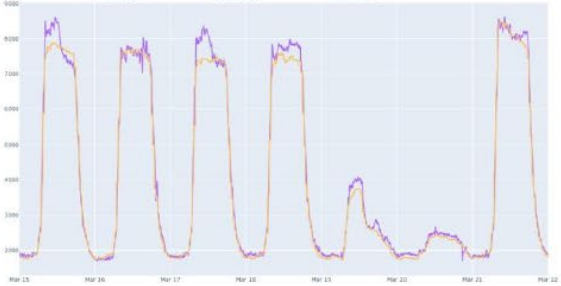
Keppel ONC

AI/ML based real-time dynamic optimization to deliver efficiency improvements and predictive maintenance to improve reliability

Chiller Optimization

Keppel's Operations Nerve Centre (ONC)

Demand forecasting using AI/ML



Features

24/7 real-time smart optimization

Better energy management by leveraging on artificial intelligence and machine learning techniques to improve asset performance

Digital twin of assets

Accurate data collection and monitoring to provide insights and operate at optimal cost & efficiency

Optional

Fault Detection & Diagnosis

Monitoring plant equipment health, allowing pre-emptive correction to minimize operational disruptions

8% improvement in chiller plant efficiency

Certification GSTC & Green Mark

BCA GREEN MARK

Green Mark 2021 In Operation (GM: 2021 In Operation)

CERTIFICATE

GOLD^{PLUS}

presented to

ORCHARD HOTEL SINGAPORE

442 Orchard Road, Singapore 238879

CEO
Building and Construction Authority

Date of Original Issue:
20/11/2025

Date of Expiry:
22/12/2028

Building and Construction Authority

CERTIFICATE
C 900674 GSTC-0105-24

Based on an audit according to the requirements stated in the GSTC Hotel Criteria, version 3, 21 December 2016 and a signed contract, Control Union Certifications herewith certifies that the facility(s) listed below are found to be in compliance with the GSTC Hotel Criteria, version 3, 21 December 2016. This guarantees that the criteria for managing GSTC certified tourism services have been met.

Name certified company	Millennium & Copthorne International Limited
Full address certified company	390 Havelock Road, #02-05 King's Centre, Singapore 169662

Certified Sites

GSTC HACU240105-1 Millennium & Copthorne International Limited (HQ)	390 Havelock Road, #02-05 King's Centre, Singapore 169662
GSTC HACU240105-2 Grand Copthorne Waterfront	392 Havelock Road, Singapore 169663
GSTC HACU240105-3 Orchard Hotel	442 Orchard Road, Singapore 238879
GSTC HACU240105-4 Copthorne King's Hotel	403 Havelock Road, Singapore 169632
GSTC HACU240105-5 M Hotel	81 Anson Road, Singapore 079908
GSTC HACU240105-6 M Social Singapore	90 Robertson Quay, Singapore 238879
GSTC HACU240105-7 Studio M	3 Nanson Road, Singapore 238910

Scope of assessment
Hotel/ Accommodation Services (Multi Site Certification)

Start date certificate	06/05/2024
Expiration date certificate	06/05/2027
Date of first GSTC certification	06/05/2024
Certificate number	C 900674 GSTC-0105-24

Authorised signatory name
Tuğce TAPAN YUNLU

Date of issue: 06/05/2024

On behalf of the Managing Director
Authorised signature

Issued by
Control Union Certifications
Meeuwenlaan 4-6 - P.O. Box 161, 8000 AD - Zwolle
The Netherlands - T +31 (0) 38 426 01 00
www.controlunion.com - certifications@controlunion.com

Control Union Certifications is accredited to provide GSTC MTO Certification on 31/10/2016 (GSTC-ACC-001)

This certificate including the annex remains the property of Control Union Certifications and can be withdrawn in case of tax measures as mentioned in the licensee contract, or in case changes or deviations of the above-mentioned data occur. The licensee is obliged to inform CUC immediately of any changes in the above-mentioned data. Only an original and signed certificate is valid.

CONTROLUNION

GSTC

Certificate version: C 900674 GSTC-0105-24

Page 1 of 1

Some initiative Implemented

GO GREEN
building a sustainable future
Dear Guest,
As part of our GO GREEN initiatives, bed linen will be changed every alternate day.
Should you wish to have your bed linen changed daily, please leave this card on the bed.
Thank you for your kind understanding and we appreciate your assistance in helping us save the environment.
THE ORCHARD
OrchardHotelSingapore

Some initiative Implemented

INFRASTRUCTURE FUNCTIONALITY
Ensures the smooth functioning of the hotel's infrastructure, contributing to a seamless guest experience

Sustainability Trainings

THANK YOU

Q & A